

**IN THE UNITED STATES DISTRICT COURT
FOR THE MIDDLE DISTRICT OF PENNSYLVANIA**

JOANNA ELENA KNIGHT,
*Individually and as Personal
Representative of the Estate of Charles
Junior Knight, III, Deceased,* and
ALLISON MICHELE GRAY
CLARKE, *Individually and as Personal
Representative of the Estate of Matthew
Clarke, Deceased,*

Plaintiffs,

v.

AVCO CORPORATION,

Defendant.

No. 4:21-CV-00702

(Chief Judge Brann)

MEMORANDUM OPINION

AUGUST 9, 2024

I. FACTUAL BACKGROUND¹

A. The Pilot and the Helicopter

Monumental Helicopters operated a helicopter flight tour, flight instruction, and rental company out of Fort Tipton Airport in Fort Meade, Maryland.² Among Monumental's fleet was a Guimbal Calibri G2 helicopter registered with the Federal Aviation Administration as N572MD (the "Helicopter").³ The Helicopter was

¹ For ease of discussion, the factual background is largely derived from the parties' statements of fact filed in conjunction with Avco's Motion for Summary Judgment.

² Doc. 75 ¶ 14; Doc. 95 ¶ 14.

³ Doc. 75 ¶¶ 8, 14-15; Doc. 95 ¶¶ 14-15.

powered by a Lycoming O-360-J2A engine, produced by Defendant Avco Corporation's Lycoming Engines division.⁴ Monumental used the Helicopter, which was restricted to Visual Flight Rules ("VFR") flights, to provide flight training to student pilots.⁵

Among those students was Charles Junior Knight II, who began flight training with Monumental in May 2017.⁶ Knight's pilot training encompassed the pilot certification requirements set forth in 14 C.F.R. Part 61, including visual flight weather planning requirements, flight requirements for lawfully operating under VFR; pre-flight procedures for determining the airworthiness of the helicopter; legally permissible altitudes for flight operations in different classes of airspace; and procedures for responding to an engine power loss, including auto rotations.⁷ It also included instruction that helicopter operation below 500 feet above ground level was permitted if it did not pose a hazard to persons or property on the surface and the minimum visibility requirements for VFR in Class G airspace were met: ½ mile visibility and clear of clouds.⁸ Knight was instructed and required by FAA regulations to ensure that the weather conditions in which he operated the Helicopter met the limitations for VFR.⁹

⁴ Doc. 75 ¶¶ 1, 8.

⁵ Doc. 75 ¶¶ 12, 15; Doc. 95 ¶¶ 12, 15.

⁶ Doc. 75 ¶ 26; Doc. 95 ¶ 26.

⁷ Doc. 75 ¶ 27.

⁸ Doc. 95 ¶ 27.

⁹ Doc. 75 ¶ 29; Doc. 95 ¶ 29.

In April 2018, Knight received his pilot's license, which restricted him to VFR operations only.¹⁰ Knight continued to rent the Helicopter after receiving his license and, in March 2019, Knight made a \$50,000 investment in Monumental which permitted him greater access to the Helicopter.¹¹ He was given access to the key box and the ability to reserve and fly the Helicopter with notice to Monumental.¹²

B. May 4, 2019 Flight and Crash

In late April 2019, Knight reserved the Helicopter for May 4, 2019 using Monumental's Google-calendar reservation system.¹³ Knight invited a friend, Matthew Clarke, to join him on the flight.¹⁴ The flight coincided with the opening of rockfish season in the Chesapeake Bay.¹⁵ Clarke's brother and brother-in-law, Tim Clarke and Ben Meredith, planned to go fishing in an area of the Bay south of Kent Island, Maryland, where Knight and Clarke hoped to fly and take aerial photographs of Tim and Ben in their respective fishing boats.¹⁶

Knight and Clarke took off from Tipton Airport at approximately 11:30 a.m.¹⁷ From approximately 12:00 p.m. to 12:11 p.m. the Helicopter's flight path, speed, and altitude were recorded by radar.¹⁸ During this period, the Helicopter circled over

¹⁰ Doc. 75 ¶ 30; Doc. 95 ¶ 30.

¹¹ Doc. 75 ¶¶ 31-32; Doc. 95 ¶¶ 31-32.

¹² Doc. 75 ¶ 33; Doc. 95 ¶ 33.

¹³ Doc. 75 ¶ 34; Doc. 95 ¶ 34.

¹⁴ Doc. 75 ¶ 35; Doc. 95 ¶ 35.

¹⁵ Doc. 75 ¶ 37; Doc. 95 ¶ 37.

¹⁶ Doc. 75 ¶¶ 37-38; Doc. 95 ¶¶ 37-38.

¹⁷ Doc. 75 ¶ 48; Doc. 95 ¶ 48.

¹⁸ Doc. 75 ¶ 51; Doc. 95 ¶ 51.

Kent Island and portions of the Chesapeake Bay at an altitude of 250 feet or below.¹⁹ Clarke exchanged several text messages with his brother-in-law in an effort to find where Ben and Tim were fishing.²⁰ The last text message, sent at 12:08 p.m. from Clarke to Ben, asked if the pair could see the Helicopter and stated “We are hitting the wall that we can’t fly through.”²¹

A few minutes later, at 12:11 p.m., the last valid data point recorded for the Helicopter showed it flying due west at a speed of 79 knots (approximately 91 mph) and at an altitude of 175 feet above the water.²² Shortly thereafter the Helicopter crashed into the water and sank upon impact.²³ Ryan Culberson, an eyewitness who witnessed the crash from a fishing boat described seeing the Helicopter “beg[i]n to lose altitude from where it was, and then within a few seconds, it plummeted at that point down to the—towards the bay, nose-diving, and then I do recall that it did kind of rotate in the process, but then after that, it hit the bay and a splash of water.”²⁴ Culberson and another eyewitness, Curtis Hoover, drove their boats to the impact

¹⁹ Doc. 75 ¶ 53; Doc. 95 ¶ 53. Plaintiffs object to Avco’s statement that, based on the radar data, the Helicopter flew at an altitude of 200 feet or below and sometimes as low as 50 feet on the basis that “[t]here can be as much as a fifty-foot difference in the reported radar and the actual position of the Helicopter.” *Id.* For present purposes, it suffices to say that, taking the margin of error into account, the Helicopter was at an altitude of 0 to 250 feet.

²⁰ Doc. 75 ¶ 54; Doc. 95 ¶ 54.

²¹ Doc. 75 ¶ 54; Doc. 95 ¶ 54. Plaintiffs aver that “the wall” refers to the “PALEO Gate,” which is a boundary imposed by the Chesapeake Bay special flight rules. *Id.*

²² Doc. 75 ¶ 55; Doc. 95 ¶ 55. Plaintiffs note that the actual altitude of the Helicopter may have differed by up to 50 feet from what was indicated by radar. *Id.*

²³ Doc. 75 ¶ 56; Doc. 95 ¶ 56.

²⁴ Doc. 75 ¶ 57; Doc. 95 ¶ 57.

location to attempt to provide aid to the Helicopter's occupants; however, when they arrived, aside from some debris, there was no sign of the Helicopter or its occupants.²⁵ Knight's and Clarke's bodies were recovered by divers later in the day and the Helicopter remained submerged for two days until it was removed from the water on May 6, 2019.²⁶

C. Cause of the Crash²⁷

1. Plaintiffs' Theory

The O-360-J2A engine which powered the Helicopter is a direct drive, four-cylinder, horizontally opposed, four-stroke, pushrod internal combustion engine.²⁸ The engine has two valves per cylinder, an intake valve and an exhaust valve.²⁹ Within each cylinder is a piston that is attached to a crankshaft via a connecting rod.³⁰ In a four-stroke engine, each piston completes four "strokes" within the cylinder to convert chemical energy to mechanical energy: (1) the intake stroke; (2) the compression stroke; (3) the power stroke; and (4) the exhaust stroke.³¹ During the intake stroke, the intake valve opens, the exhaust valve is closed, and the piston moves away from the cylinder head, drawing an air-fuel mixture into the

²⁵ Doc. 75 ¶ 62; Doc. 95 ¶ 62.

²⁶ Doc. 75 ¶¶ 64-65; Doc. 95 ¶¶ 64-65.

²⁷ In discussing the parties' theories of the case, the Court assumes the veracity of each for the ease of discussion. Nothing in this section, or the Opinion generally, should be understood as the Court endorsing either parties' version of events.

²⁸ Compl. ¶ 11, Doc. 1; Mark Seader Expert Report, Doc. 87-1, at 2; Doc. 96, at 4-5.

²⁹ Doc. 96, at 4.

³⁰ *Id.* at 5.

³¹ Colin Sommer Expert Report, Doc. 85-1, at 7.

cylinder.³² The intake valve closes, the exhaust valve remains closed, and the piston then moves toward the cylinder head, compressing—hence “compression stroke”—the air-fuel mixture within the cylinder.³³ As the piston approaches “top-dead-center,” two spark plugs ignite the compressed air-fuel mixture, transforming chemical energy to mechanical energy; the explosion drives the piston away from the cylinder head, which rotates the crankshaft, which in turn powers—hence “power stroke”—the propeller.³⁴ The exhaust valve then opens, beginning the exhaust stroke, and the piston moves towards the cylinder head, pushing the exhaust gases out through the exhaust valve.³⁵

In a pushrod engine, the valves are opened when a lobed camshaft, geared to the crankshaft, causes a pushrod to articulate a rocker arm which, in turn, pushes the valve into the cylinder to its open position.³⁶ The rocker arm does not contact the valve directly.³⁷ Instead, it contacts a “rotator cap” that is affixed at the end of the valve stem.³⁸ When the camshaft rotates to its relaxed position, a valve spring forces the valve closed against the valve seat inside the cylinder head.³⁹

³² *Id.*

³³ *Id.*

³⁴ *Id.*

³⁵ *Id.*

³⁶ Doc. 96, at 5.

³⁷ *Id.*

³⁸ *Id.*

³⁹ *Id.*

Within the cylinder head, the valve moves within a valve guide.⁴⁰ The interface between the valve stem and the valve guide is lubricated with engine oil.⁴¹ Excessively high temperatures in the exhaust valve guide can cause “coking,” or burnt oil accumulating along the valve-to-guide interface.⁴² The accumulation of burnt oil inhibits the movement of the valve within the guide, causing it to stick.⁴³

Plaintiffs claim that the Helicopter “experienced a catastrophic engine malfunction caused by the sticking of the number one cylinder valve.”⁴⁴ The resistance created by the coking exceeded the force of the valve spring, preventing the exhaust valve from closing.⁴⁵ This resulted in a loss of compression, which resulted in a loss of engine power.⁴⁶ Reacting to the power loss, Knight increased collective—increased the rotor blade pitch to initiate a climb—which significantly increased the resistance against the oncoming air.⁴⁷ The engine was unable to produce power sufficient to overcome the increase in resistance, causing rotor droop—a decrease in the inertia of the main rotor blades—and the Helicopter could not remain in flight.⁴⁸

⁴⁰ *Id.*

⁴¹ *Id.* at 6.

⁴² *Id.* at 8; Sommer Report at 9.

⁴³ Doc. 96, at 8.

⁴⁴ Compl. ¶ 18.

⁴⁵ Doc. 96, at 53.

⁴⁶ *Id.*

⁴⁷ *Id.* at 17.

⁴⁸ *Id.*

The coking on the valve stem was the result of a design defect. To prevent coking, the engine must be designed to provide for adequate heat dissipation away from the valve-to-guide interface so that temperatures do not reach the coking threshold.⁴⁹ The O-360-J2A engine dissipates heat by drawing it from the exhaust valve face, through the stem which is filled with sodium, and expelling it through the valve-to-guide interface into the valve guide boss.⁵⁰ To prevent the temperatures from reaching the coking threshold, the valve must rotate within the guide to ensure heat is distributed evenly around the circumference and along the length of the valve stem and guide so as to avoid “hot spots.”⁵¹ The design of the engine does not include an affirmative mechanical means to cause the exhaust valve to rotate.⁵² Instead, the rocker arm is designed to contact the outer surface of the rotator cap, causing it to turn at small indices each time it is struck, and valve rotation is facilitated by engine vibration when the valve is open.⁵³

2. Avco’s Theory

When Plaintiffs arrived at the hangar on May 4, 2019, they did not encounter any Monumental employees as Monumental had cancelled its scheduled sight-seeing flights due to the weather conditions.⁵⁴ While at the hangar, Clarke exchanged

⁴⁹ *Id.* at 6.

⁵⁰ *Id.* at 6-7.

⁵¹ *Id.* at 7.

⁵² *Id.*

⁵³ *Id.* at 7-8.

⁵⁴ Doc. 75 ¶ 41.

text messages with Ben and Tim, first telling them, at 8:29 a.m., that it “[l]ooks like we’re going to be flying,” then, at 9:22 a.m., that he was “[h]oping this fog burns off so we can make it happen,” and finally, at 10:36 a.m., “The closer you stayed at Poplar Island the better chance we might have a finding you with this low ceiling there’s flight restrictions [sic].”⁵⁵ At 10:45 a.m., the National Weather Service issued a weather update for the area surrounding Kent Island and Poplar Island that advised of cloud ceilings below 1,000 feet, visibility below 3 statute miles, precipitation, mist, and fog.⁵⁶ At 11:02 a.m., Knight filed a flight plan with FAA flight services for Tipton Airport and was told by the flight briefer that a VFR flight was “not recommend[ed]” because the weather was “showing IFR conditions in that area.”⁵⁷ The briefer asked Knight if he wanted a standard weather briefing, to which he responded that he was “all set.”⁵⁸ Plaintiffs took from Tipton Airport at approximately 11:30 a.m., flying toward Kent Island where they arrived at around 12:00 p.m.⁵⁹

After circling the area for approximately 11 minutes in search of Ben and Tim’s fishing boats, the Helicopter crashed into the bay. Witnesses to the crash indicated that the Helicopter had been flying at a low altitude through waves of

⁵⁵ *Id.* ¶ 44.

⁵⁶ *Id.* ¶ 45.

⁵⁷ *Id.* ¶ 46.

⁵⁸ *Id.* ¶ 47.

⁵⁹ *Id.* ¶¶ 48, 50.

occasionally dense fog.⁶⁰ At 12:34 p.m., after the crash, the owner of Monumental texted Knight, “I’m assuming you cancelled for weather.”⁶¹ Other witnesses stated that they were surprised that Plaintiffs were flying in such conditions.

However, having previously committed to take Clarke on a flight, Knight felt pressured to conduct the flight despite the weather.⁶² Once in flight, Knight was distracted by the task of trying to locate Ben and Tim’s fishing boats.⁶³ Upon flying into a patch of fog or a cloud, Knight attempted to descend below the cloud to regain visual contact with the water surface.⁶⁴ However, because the Helicopter was at such a low altitude, which Knight was unable to determine due to the lack of visual cues, there was insufficient altitude for him to descend in a rapid manner.⁶⁵

II. PROCEDURAL HISTORY

Plaintiffs Joanna Elena Knight and Allison Michele Gray Clarke initiated this litigation on behalf of themselves and as the personal representatives of the estates of Charles Junior Knight, III and Matthew David Clarke respectively with the filing of a Complaint against Avco Corporation.⁶⁶ In their Complaint, Plaintiffs bring claims of strict liability (Count I), Negligence (Count II), and breach of express and

⁶⁰ *Id.* ¶¶ 57-61.

⁶¹ *Id.* ¶ 63.

⁶² Gregory Feith Expert Report, Doc. 67-1, at 15-16.

⁶³ *Id.*

⁶⁴ *Id.* at 17.

⁶⁵ *Id.* at 17-18.

⁶⁶ Compl.

implied warranties (Count III).⁶⁷ Roughly a year into discovery, the parties requested to engage in a settlement conference before a Magistrate Judge pursuant to Local Rule 16.9.1.⁶⁸ Before a settlement conference was held, the parties opted to instead proceed with the litigation.⁶⁹

On October 31, 2023, Plaintiffs filed *Daubert* Motions seeking to exclude Defense Experts Gregory Feith,⁷⁰ Scott Shappell,⁷¹ and Timothy Tucker,⁷² and Avco filed an omnibus *Daubert* Motion seeking to exclude Plaintiff Experts A.J. Fiedler, Colin Sommer, and Mark Seader,⁷³ and an accompanying Motion for Summary Judgment.⁷⁴ On April 18, 2024, Avco informed the Court that it had withdrawn Scott Shappell as a testifying expert. On April 24, 2024, the Court held a *Daubert* hearing as to the remaining contested experts. Following the hearing, the Court denied the Motion to exclude Shappell as moot and requested supplemental briefing, which the

⁶⁷ *Id.*

⁶⁸ Nov. 9, 2022 Letter to Court, Doc. 36.

⁶⁹ May 1, 2023 Status Report, Doc. 54.

⁷⁰ Pls. Mot. to Exclude G. Feith, Doc. 66; Supp. Br., Doc. 67; Opp'n Br., Doc. 97; Reply Br., Doc. 107.

⁷¹ Pls. Mot. to Exclude S. Shappell, Doc. 68; Supp. Br., Doc. 69; Opp'n Br., Doc. 98; Reply Br., Doc. 108.

⁷² Pls. Mot. to Exclude T. Tucker, Doc. 70; Supp. Br., Doc. 71; Opp'n Br., Doc. 99; Reply Br., Doc. 109.

⁷³ Def. *Daubert* Mot. Doc. 64.; Supp. Br., Doc. 65; Opp'n Br., Doc. 94; Reply Br., Doc. 110. Colin Sommer's father, Donald Sommer, has also been retained as an expert by Plaintiffs. For ease of discussion, the Court refers to Colin Sommer by his last name and his father as Donald Sommer.

⁷⁴ Def. Mot. Summ. J., Doc. 73; Supp. Br., Doc. 74; Opp'n Br., Doc. 96; Reply Br., Doc. 111.

parties have filed.⁷⁵ Accordingly, the parties' Motions are now fully briefed and ripe for disposition.

III. FEDERAL RULE OF EVIDENCE 702

Federal Rule of Evidence 702 requires that expert testimony is (1) qualified, (2) reliable, and (3) assists the trier of fact.⁷⁶ “Before the proposed testimony gets presented to the jury, the trial judge evaluates its admissibility based on these three requirements.”⁷⁷ “Where the admissibility of expert testimony is specifically questioned, Rule 702 and *Daubert* require that the district court make explicit findings, whether by written opinion or orally on the record, as to the challenged preconditions to admissibility.”⁷⁸

A. Qualifications

“Qualification requires ‘that the witness possess specialized expertise.’”⁷⁹ Rule 702’s qualification requirement is to be liberally construed.⁸⁰ The United States Court of Appeals for the Third Circuit has instructed that courts should “eschew[] overly rigorous requirements of expertise and [be] satisfied with more generalized

⁷⁵ Apr. 29, 2024 Ord., Doc. 118; Pls. Supp. Br., Doc. 124; Def. Supp. Br., Doc. 125.

⁷⁶ *UGI Sunbury LLC v. A Permanent Easement for 1.7575 Acres*, 949 F.3d 825, 832 (3d Cir. 2020).

⁷⁷ *U.S. v. Schiff*, 602 F.3d 152, 172 (3d Cir. 2010).

⁷⁸ *Sardis v. Overhead Door Corp.*, 10 F.4th 268, 283 (4th Cir. 2021) (citing *United States v. Ruvalcaba-Garcia*, 923 F.3d 1183, 1190 (9th Cir. 2019); *Carlson v. Bioremedi Therapeutic Sys., Inc.*, 822 F.3d 194, 201 (5th Cir. 2016); *Gayton v. McCoy*, 593 F.3d 610, 616 (7th Cir. 2010)).

⁷⁹ *Pineda v. Ford Motor Co.*, 520 F.3d 237, 244 (3d Cir. 2008) (quoting *Schneider ex rel. Estate of Schneider v. Fried*, 320 F.3d 396, 404 (3d Cir.2003)).

⁸⁰ *Id.* (citing *In re Paoli R.R. Yard PCB Litig.*, 35 F.3d 717, 741 (3d Cir. 1994)).

qualifications.”⁸¹ Accordingly, “it is an abuse of discretion to exclude testimony simply because the trial court does not deem the proposed expert to be the best qualified or because the proposed expert does not have the specialization that the court considers most appropriate.”⁸² A “broad range of knowledge, skills, and training” suffice to qualify an expert.⁸³

B. Reliability

“Rule 702’s reliability threshold requires expert testimony to be ‘based on methods and procedures of science, not on subjective belief and unsupported speculation.’”⁸⁴ The opinion of a qualified expert “is admissible so long as the *process or technique* [as opposed to the conclusion] the expert used in formulating the opinion is reliable.”⁸⁵ Thus, “[t]he reliability of an expert’s conclusions and opinions hinges on the reliability of the expert’s methodology.”⁸⁶

The United States Supreme Court has recognized that “the relevant reliability concerns may focus upon personal knowledge or experience.”⁸⁷ In such

⁸¹ *Paoli*, 35 F.3d at 741 (citing *Hammond v. International Harvester Co.*, 691 F.2d 646, 652–53 (3d Cir. 1982); *Knight v. Otis Elevator Co.*, 596 F.2d 84, 87–88 (3d Cir. 1979)).

⁸² *Id.* (quoting *Holbrook v. Lykes Bros. S.S. Co.*, 80 F.3d 777, 782 (3d Cir. 1996)).

⁸³ *Pineda*, 520 F.3d at 244 (quoting *Paoli*, 35 F.3d at 741).

⁸⁴ *UGI Sunbury*, 949 F.3d at 833–34 (quoting *Karlo v. Pittsburgh Glass Works, LLC*, 849 F.3d 61, 80 (3d Cir. 2017); *In re TMI Litig.*, 193 F.3d 613, 703 (3d Cir. 1999)).

⁸⁵ *In re TMI Litig.*, 193 F.3d at 664 (citing *Paoli*, 35 F.3d at 742) (emphasis in original).

⁸⁶ *Wood v. Showers*, 822 F. App’x 122, 124 (3d Cir. 2020) (citing Fed. R. Evid. 702(c)).

⁸⁷ *Kumho Tire Co., Ltd. v. Carmichael*, 526 U.S. 137, 150 (1999). *See also Oddi v. Ford Motor Co.*, 234 F.3d 136 (3d Cir. 2000) (“[T]here may be some circumstances where one’s training and experience will provide an adequate foundation to admit an opinion and furnish the necessary reliability to allow a jury to consider it . . .”).

circumstances, the expert “must explain how that experience leads to the conclusion reached, why that experience is a sufficient basis for the opinion, and how that experience is reliably applied to the facts.”⁸⁸

In *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, the Supreme Court instructed that “[t]he focus . . . must be solely on principles and methodology, not on the conclusions they generate.”⁸⁹ Therefore, parties offering expert testimony do not “have to prove their case twice—they do not have to demonstrate to the judge by a preponderance of the evidence that the assessments of their experts are *correct*, they only have to demonstrate by a preponderance of evidence that their opinions are reliable.”⁹⁰

Nevertheless, because “expert evidence can be both powerful and quite misleading,”⁹¹ courts have recognized that “the importance of the gatekeeping function cannot be overstated.”⁹² A recent amendment to Rule 702 “clarif[ied] and emphasize[d] that expert testimony may not be admitted unless the proponent demonstrates to the court that it is more likely than to that the proffered testimony meets the admissibility requirements set forth in the rule.”⁹³ The amendment was motivated by the Advisory Committee’s “observation that in ‘a number of federal

⁸⁸ Fed. R. Evid. 702, Advisory Comm. Notes, 2000 Amendments.

⁸⁹ 509 U.S. 579, 595 (1993).

⁹⁰ *Paoli*, 35 F.3d at 744.

⁹¹ *Sardis*, 10 F.4th at 283 (quoting *Daubert*, 509 U.S. at 592).

⁹² *Id.* (quoting *United States v. Barton*, 909 F.3d 1323, 1331 (11th Cir. 2018)).

⁹³ Fed. R. Evid. 702, Advisory Comm. Notes, 2023 Amendments.

cases . . . judges did not apply the preponderance standard of admissibility to Rule 702’s requirements of sufficiency of basis and reliable application of principles and methods, instead holding that such issues were ones of weight for the jury.”⁹⁴ The Committee emphasized that rulings which have held “the critical questions of the sufficiency of an expert’s basis for his testimony, and the application of the expert’s methodology, are generally questions of weight and not admissibility” “are an incorrect application of Rules 702 and 104(a).”⁹⁵

In sum, it is for the factfinder to decide whether an expert is correct, but that question can only go to the jury if the Court is satisfied that the expert’s opinions are reliable by a preponderance of the evidence.

C. Fit

The issue of whether an expert’s testimony will assist the trier of fact “is typically understood in terms of whether there is a sufficient ‘fit’ between the expert’s testimony and the facts that the jury is being asked to consider.”⁹⁶ In assessing whether an expert’s proposed testimony “fits,” courts ask “whether [the]

⁹⁴ *Sardis*, 10 F.4th at 283-84 (quoting Advisory Comm. on Evidence Rules, *Agenda for Committee Meeting* 17 (Apr. 30, 2021)).

⁹⁵ *Id.* at 284 (quoting Advisory Comm., *Agenda* at 105, 107). *See also Wood v. Showers*, F. App’x 122, 125 (3d Cir. 2020) (rejecting argument that flaws in the reliability of an expert’s principles and methods are a question for the jury); *Kumho Tire*, 526 U.S. at 158-59 (Scalia, J. concurring) (“[T]rial-court discretion in choosing the manner of testing expert reliability . . . is not discretion to abandon the gatekeeping function . . . [and] it is not discretion to perform the function inadequately.”).

⁹⁶ *Schiff*, 602 F.3d at 172-73 (citing *Daubert*, 509 U.S. at 591).

expert testimony proffered . . . is sufficiently tied to the facts of the case that it will aid the jury in resolving a factual dispute.”⁹⁷

Prior to the recent amendment to Rule 702, the Third Circuit instructed that the “‘standard [for fit] is not that high,’ but ‘is higher than bare relevance’”⁹⁸ As amended, Rule 702 emphasizes that the proponent of the expert testimony must “demonstrate[] by a preponderance of the evidence that the expert’s scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact at issue.”⁹⁹ Therefore, the “not that high, but higher than bare relevance” standard appears to reflect the misapplication of Rule 702 identified by the Rules Committee.

This Court is, of course, bound by the precedential decisions of the Third Circuit. That is especially so when the relevant precedential decision interprets an act of Congress.¹⁰⁰ However, that is so only because “Congress can correct any mistake it sees” in such cases.¹⁰¹ That is precisely what Congress has done here. Accordingly, this Court is not obliged to follow precedent which represents an erroneous application of Rule 702.¹⁰² The party offering the expert testimony must

⁹⁷ *Id.* (quoting *Daubert*, 509 U.S. at 591; *United States v. Downing*, 753 F.2d 1224, 1242 (3d Cir. 1985)).

⁹⁸ *Id.* (quoting *Paoli*, 35 F.3d at 745).

⁹⁹ Fed. R. Evid. 702.

¹⁰⁰ *See Kimble v. Marvel Ent., LLC*, 576 U.S. 446, 456 (2015) (“ . . . *stare decisis* carries enhanced force when a decision . . . interprets a statute”).

¹⁰¹ *Id.*

¹⁰² *Jakomas v. City of Pittsburgh*, 342 F. Supp. 3d 632, 647 (W.D. Pa. 2018).

show, by a preponderance of the evidence, that the proffered testimony will assist the jury or “fits” the facts of the case.¹⁰³

The Third Circuit has instructed that, in weighing whether the proffered witness testimony will help the trier of fact, “the District Court must ensure that an expert does not testify as to the governing law of the case.”¹⁰⁴ “[T]he line between admissible and inadmissible expert testimony as to the customs and practices of a particular industry often becomes blurred when the testimony concerns a party's compliance with customs and practices that implicate legal duties.”¹⁰⁵ “It is settled

¹⁰³ In a recent decision, the Third Circuit seems to have extended this apparent misapplication of Rule 702 to the second prong, holding that “[t]he ‘reliability and believability of expert testimony . . . is exclusively for the jury to decide.’” *United States v. Care Alternatives*, 952 F.3d 89, 98 (3d Cir. 2020) (quoting *United States v. Paulus*, 894 F.3d 267, 277 (6th Cir. 2018)). The language from *Paulus* excised in *Care Alternatives* changes the meaning of the sentence. Compare *Care Alternatives*, 952 F.3d at 98 (“The reliability and believability of expert testimony is exclusively for the jury to decide.”) with *Paulus*, 894 F.3d 277 (“The reliability and believability of expert testimony, *once that testimony has been properly admitted*, is exclusively for the jury to decide.”) (emphasis added, internal quotations and citations omitted in both).

Adding to the confusion, the Third Circuit explicitly rejected a “lower bar for expert testimony” where flaws “such as the reliability of an expert's principles and methods would be primarily a question for the jury and would not be screened by the trial judge” in a non-precedential opinion contemporaneous with *Care Alternatives*. *Wood*, 822 F. App'x at 125.

The issue in *Care Alternatives* was whether expert opinion was properly excluded on the basis that it was false. As discussed above, it is well settled that “[a]n opinion may be reliable ‘even though the judge thinks the opinion is incorrect.’” *Andrews v. Brethren Mut. Ins. Co.*, No. 4:19-CV-02107, 2023 WL 6690710, at *6 (M.D. Pa. Oct. 12, 2023) (quoting *Paoli*, 35 F.3d at 744). Thus, *Care Alternatives* can perhaps be read in that narrow context.

In all events, the Court will, as discussed above, follow Third Circuit precedent which reflects a correct application of Rule 702. See *TMI Litig.*, 193 F.3d at 665 (observing that the proponent of expert testimony must show the testimony is reliable by a preponderance of the evidence). To the extent that *Care Alternatives* is inconsistent with Rule 702 as amended, the Court declines to follow it for the reasons stated herein.

¹⁰⁴ *Berkeley Inv. Group, Ltd. v. Colkitt*, 455 F.3d 195, 217 (3d Cir. 2006).

¹⁰⁵ *Id.*

law that an expert may testify about common behavior patterns in a profession or subculture”¹⁰⁶ so long as the expert does not testify as to “legal duties arising therefrom.”¹⁰⁷

IV. PLAINTIFF EXPERTS

In conjunction with its *Daubert* Motion, Avco filed a Motion for Summary Judgment in which it argues that “there is no admissible evidence whatsoever that a defect in the engine caused the accident.”¹⁰⁸ That Motion, then, largely rests on the premise that Plaintiffs’ experts’ opinions “are not admissible under Rule 702 and cannot be used by Plaintiffs to make a *prima facie* case against Avco.”¹⁰⁹ Therefore, the Court begins with Avco’s *Daubert* Motion to Exclude Plaintiffs’ Experts. In that Motion, Avco argues: 1) Mark Seader’s dynamometer test is neither reliable nor relevant; 2) A.J. Fiedler’s and Colin Sommer’s causation opinions are unreliable; and 3) Sommer’s alternative design and user expectations opinions are unreliable.¹¹⁰ For the reasons stated below, the Court will deny that Motion, and therefore also deny Avco’s Motion for Summary Judgment.

¹⁰⁶ *U.S. v Price*, 458 F.3d 202, 212 (3d Cir. 2006) (citing *United States v. Watson*, 260 F.3d 301, 307 (3d Cir. 2001) (collecting cases)).

¹⁰⁷ *First Nat’l State Bank v. Reliance Elec. Co.*, 668 F.2d 725, 731 (3d Cir. 1981) (*per curiam*).

¹⁰⁸ Doc. 74, at 2.

¹⁰⁹ *Id.* at 3. *Cf.* Doc. 125, at 3, n.1 (noting that Avco argues it may still prevail on its motion for summary judgment even if the Court finds Plaintiffs’ experts’ causation opinions sufficiently reliable). In all events, resolving the pending *Daubert* motions clarifies the issues presented by Avco’s summary judgment motion.

¹¹⁰ *See generally* Doc. 65, Sections I-III.

A. Mark Seader's Engine Test

Mark Seader, Plaintiffs' engine test expert, conducted two tests on an exemplar O-360-J2A to determine (i) the impact that a valve's failure to rotate within its guide has on heat dissipation, and (ii) the power loss resulting from a stuck valve. Avco argues that the latter test, and all the expert opinions that rely on it, should be excluded.¹¹¹

To recreate the effect of a sticking exhaust valve, Seader modified the cylinder head to install a bolt which, when tightened, would prevent the exhaust valve from closing beyond 0.1"—one tenth of one inch.¹¹² Seader chose this position so as to avoid "the risk of the valve contacting the piston, but [keep] it open enough so that [there was] zero compression."¹¹³ The bolt was tightened while the engine was running, at which point the "engine started stumbling and . . . losing power."¹¹⁴ Engine power, measured by a dynamometer, decreased immediately, resulting in a 36% loss in power within approximately five seconds.¹¹⁵

Avco suggests that, "Despite the view shared by all of Plaintiffs' experts that the No. 1 exhaust valve on the accident engine was intermittently sticking and never became 'seized' at any point before the accident, Seader did not design the

¹¹¹ *Id.* at 27-34.

¹¹² Seader Dep., Doc. 72-19, 189:24-190:2, 217:9-218:17; Hr'g Tr., Doc. 119, 66:21-67:9, 99:3-7, 166:24-167:2.

¹¹³ Seader Dep. 218:1-3.

¹¹⁴ *Id.* 218:9-17, 219:13-15, 222:5-10, 224:18-22.

¹¹⁵ Hr'g Tr. 168:8-25, 177:23-178:12.

dynamometer test to replicate an intermittently sticking exhaust valve.”¹¹⁶ Instead, Seader’s test “simulate[d] a seized exhaust valve, bolted in a 0.1-inch open position, for a 6-second period.”¹¹⁷ Therefore, Avco asserts, the opinions based on Seader’s test are neither reliable nor relevant.¹¹⁸

Plaintiffs suggest that Avco misunderstands the nature of the alleged malfunction. Plaintiffs clarify that an “intermittent[ly] sticking valve does not mean that the malfunction itself is intermittent. Rather, the sticking or the state of being immobile is intermittent.”¹¹⁹ Put differently, Plaintiffs’ theory is that the exhaust valve could not travel along its full range of motion. Rather than closing completely following the exhaust stroke, the valve would remain slightly open, resulting in a loss of compression as air is pushed out through the exhaust valve, rather than compressed in the cylinder.

In reply, Avco accuses Plaintiffs of “chang[ing] their liability theory to avoid the factual pitfalls on which it is based.”¹²⁰ Avco asserts that there is a material difference between a valve which is moving, even if not along its full range of travel, and one which is sticking.¹²¹ Avco also rejects Plaintiffs’ claim that whether the valve was moving or fixed in place is irrelevant because both failure modes result in

¹¹⁶ Doc. 65, at 29.

¹¹⁷ *Id.*

¹¹⁸ *Id.* at 27.

¹¹⁹ *Id.* at 40.

¹²⁰ Doc. 110, at 4 n.1.

¹²¹ *Id.* at 5.

zero compression. Avco suggests that Plaintiffs' position undermines Seader's test, "as the undisputed facts show that the No. 1 cylinder was producing compression both before and after the accident."¹²²

1. Intermittently Sticking Valve

To the extent Avco argues that Plaintiffs' characterization of the purported malfunction as a "sticking valve" has sown confusion, the Court agrees. The word stuck, as commonly understood, means "[h]eld fast or trapped in some place or position."¹²³ This hardly seems the best adjective to describe the failure mode suggested by Plaintiffs and their experts.¹²⁴ At the April 24, 2024 hearing, Sommer and Seader clarified that the valve on the test engine was not, as Avco suggests in its briefing, stuck in position; rather, the valve could move along its full range of travel, less the last tenth of an inch prior to closing completely.¹²⁵ This is consistent with Plaintiffs' theory of the case, which is that the engine experienced a loss in compression from a failure of the No. 1 exhaust valve to close completely.

¹²² *Id.*

¹²³ *Stuck*, Oxford English Dictionary Online Ed. (accessed July 8, 2024).

¹²⁴ Because it is the term used by the parties, the Court nevertheless will refer to the purported failure mode as that of an intermittently sticking valve for ease of discussion.

¹²⁵ *Supra* n.112. The relevant testimony was, in large part, elicited from Colin Sommer, rather than Seader. As Seader and Sommer collaborated on the test, as well as previous similar tests, Hr'g Tr. 80:9-81:24, 151:22-152:3, his testimony as to the procedure which was carried out is relevant to the analysis of Seader's opinion. Further, Seader also confirmed, albeit less explicitly, that the valve could still open completely once the valve was tightened. *Id.* at 166:24-167:2.

The Court also finds that the discussion regarding whether the valve was permanently stuck or intermittently sticking is a red herring for the purposes of conducting the *Daubert* analysis. As Seader noted, the nature of the accident meant that there was not enough “time for intermittency.”¹²⁶ Though the parties dispute what caused the accident, they broadly agree that the nature of the accident was immediate; the Helicopter was flying at a relatively stable altitude until it entered a nosedive and rapidly descended into the water.

Seader testified that an intermittently sticking valve would be apparent to the pilot immediately.¹²⁷ His engine test also showed that, when the malfunction occurs, the power loss is instantaneous.¹²⁸ Sommer explains that the immediate loss in power would result in a near immediate loss in altitude.¹²⁹ Given the altitude of the Helicopter, Knight would not have had a chance to adequately respond to an engine malfunction.¹³⁰ Therefore, while any malfunction may have resolved itself in a few seconds,¹³¹ the Helicopter was already in the water before that could occur.

2. Weak vs. No Compression

Avco overstates the extent to which it is undisputed that the No. 1 cylinder was producing low, but not zero, compression before and after the accident. During

¹²⁶ Hr’g Tr. 183:2.

¹²⁷ *Id.* 181:10-13.

¹²⁸ *Id.* 181:5-9.

¹²⁹ Sommer Report 18.

¹³⁰ Hr’g Tr. 113:17-21.

¹³¹ *Id.* 149:14-18, 179:5-24.

the NTSB investigation, “[t]humb compression and suction were noted on the Nos. 2, 3, and 4 cylinders. The No. 1 cylinder was removed since it exhibited weak compression and was examined.”¹³² “Thumb compression” is determined by “put[ting a] thumb over the spark plug hole and feel[ing] for air pressure.”¹³³ David Harsanyi, an air safety investigator who represented Lycoming during the NTSB investigation, conducted the thumb compression test which formed the basis for the NTSB’s finding in its report.

During the hearing, Colin Sommer testified that he has done “numerous” thumb compression tests and, in his experience, “the difference between nothing, and super low, or low, or weak is very difficult to tell with your thumb.”¹³⁴ A.J. Feidler testified similarly, specifically recalling an investigation in which the NTSB report noted thumb compression despite the fact that, due to the condition of that engine, it would have been “impossible to have any compression.”¹³⁵ Mark Seader testified that a finding of “weak” compression via a thumb compression test is not quantifiable.¹³⁶ He further related that the NTSB’s decision to remove the No. 1 cylinder and independently test it based on “thumb pressure that was weak” is “a big step” and suggests that there was a problem with the cylinder.¹³⁷ Randall Knuteson,

¹³² NTSB Report, Doc. 76-1, at 6.

¹³³ D. Harsanyi Dep., Doc. 110-2, 106:10-13.

¹³⁴ Hr’g Tr. 75:2-6, 75:16-21.

¹³⁵ *Id.* 153:10-21.

¹³⁶ *Id.* 184:2-14.

¹³⁷ *Id.* 161:25-162:13, 185:5-14.

Avco's engine expert, also noted in his Report that "[w]ithout the use of a pressure differential gauge, there was no way to quantify the actual diminished compression noted in the #1 cylinder."¹³⁸

The Court, then, is unpersuaded by Avco's attempts to fault Sommer for failing to produce some "evidence or testing or science or engineering upon which [he is] making [the] distinction [between low and zero compression.]"¹³⁹ There is nothing particularly "scientific" about the thumb compression test performed by Harsanyi. During the intake stroke, the piston travels away from the cylinder head, pulling air through both the properly functioning intake valve, and the malfunctioning exhaust valve. Then, during the compression stroke, the intake valve closes, but the malfunctioning exhaust valve remains open. As the piston moves back toward the cylinder head, the air is pushed out through the exhaust valve, rather than compressed within the combustion chamber. But air is not sentient. It does not know that it can escape through the open exhaust valve. It is pushed towards the entire face of the cylinder head, which includes the valves and the spark plug hole, with equal force. Even at a low RPM, this process repeats itself several times a second. Therefore, it follows that someone who places their thumb over the spark plug hole will feel *something*, even if the cylinder cannot produce measurable compression.

¹³⁸ R. Knuteson Expert Report, Doc. 76-34, at 18.

¹³⁹ Hr'g Tr. 76:12-24.

Further, Sommer's 21 years of experience of conducting thumb compression tests and reading NTSB reports is more than sufficient to render his opinion that "there's no way to say from one person to the other person as to what's an accurate thumb versus an inaccurate thumb" reliable under Rule 702.¹⁴⁰ As is Fiedler's similarly extensive experience, including real-world experience in a situation where a thumb compression test produced a demonstrably false result.

3. Analysis

Plaintiffs bear the burden of showing that the "test conditions were substantially similar" to conditions on the Helicopter.¹⁴¹ The Court finds by a preponderance of the evidence that Plaintiffs have met that burden. Seader's test was conducted on the same model engine as was installed in the Helicopter. Inspection and testing revealed that the No. 1 exhaust valve did not seal, resulting in a loss of compression. As Avco notes, service records of the Helicopter reveal that there was no such issue prior to the flight. That Charles Knight was able to pilot the Helicopter for some time suggests that there was no issue during the flight prior to the crash. Thus, it follows that the issue developed sometime before the inspection and after Knight took off.

Avco suggests that the failure of the No. 1 exhaust valve to seat was "the obvious result of plunging the engine into the brackish waters of the Chesapeake

¹⁴⁰ *Id.* at 75:9-12, 76:1-11.

¹⁴¹ *Stecyk v. Bell Helicopter Textron, Inc.*, 295 F.3d 408, 412 (3d Cir. 2002).

Bay and then allowing it to sit unpreserved for 19 months.”¹⁴² Perhaps. But, Plaintiffs’ expert Mark Hood, who Avco has not challenged, rejected that hypothesis, instead identifying a buildup of coking as the culprit.¹⁴³ To the extent that Hood is correct, the buildup of coking—the result of burning engine oil—could only have resulted when the engine was running. Seader’s test conditions then are, at a minimum, “substantially similar” to the condition of the Helicopter.

Seader’s test does not suffer from the defects of the expert test at issue in *Meadows v. Anchor Longwall and Rebuild, Inc.*,¹⁴⁴ a case upon which Avco relies. There, the expert “did not examine the specific [equipment] that [the plaintiff] was working on at the time of the accident.”¹⁴⁵ Here, Plaintiffs experts conducted an extensive investigation of the specific engine pulled from the Helicopter. Further, the expert in *Meadows* “conceded that his . . . tests did not replicate the accident as he hypothesized” or “the assembly [of the equipment] that existed” at the time of the subject accident.¹⁴⁶ Here, Seader explicitly attempted to recreate a complete loss in compression, which is what Plaintiffs’ experts hypothesize caused the accident. Avco may dispute that a complete loss of compression in fact occurred, but the Court

¹⁴² Doc. 65, at 1.

¹⁴³ Hood Rebuttal Report, Doc. 88-2, at 1.

¹⁴⁴ 306 F. App’x 781 (3d Cir. 2009).

¹⁴⁵ *Id.* at 789.

¹⁴⁶ *Id.*

finds that Plaintiffs experts have established that their opinion that such a loss of compression did happen is reliable, if not correct.

The Court also finds unpersuasive Avco’s suggestion that Plaintiffs’ experts have “constantly modif[ied] their opinions in order to work around the flaws pointed out by Avco.”¹⁴⁷ As an initial matter, it is not uncommon for facts to change or evolve as the parties engage in discovery.¹⁴⁸ Even so, Plaintiffs’ initial theory of the case—that a “stuck exhaust valve in the number one cylinder caused a reduction of engine power sufficient enough to prevent safe flight and caused the Helicopter to depart controlled flight and impact into the Chesapeake Bay”¹⁴⁹—is largely unchanged after three years of litigation.¹⁵⁰

Nor does the Court agree that the experts themselves have impermissibly changed their opinions. Avco suggests that Plaintiffs’ experts opined for the first time during the hearing that “the NTSB’s ‘thumb compression test’ establishing ‘weak’ compression was unreliable, and that it only took 1-2 seconds for the accident engine to lose 36% of its power, rather than the 5 seconds they previously asserted.”¹⁵¹

¹⁴⁷ Doc. 125, at 20 n.8.

¹⁴⁸ See *Livingston v. Berger*, No. CV 2019-0012, 2022 WL 613277, at *4 (D.V.I. Mar. 1, 2022) (observing that the Federal Rules of Civil Procedure “provide the opportunity—indeed the duty—to supplement [discovery] responses” as facts change or evolve).

¹⁴⁹ Compl. ¶ 20.

¹⁵⁰ Any shift in the Plaintiffs’ theory largely turns on the extent to which a “stuck” exhaust valve describes the failure mode suggested by Plaintiffs, as discussed by the Court above.

¹⁵¹ Doc. 125, at 22.

Regarding the former, as Avco points out, each of Plaintiffs' challenged experts notes that weak compression was found via a thumb test performed during the NTSB investigation.¹⁵² That Plaintiffs' experts noted the findings of the NTSB investigation as part of their own is unremarkable, and not the same as adopting its conclusions. On the contrary, Sommer noted that the test performed by the NTSB "has never been identified as an appropriate procedure and does not follow proper aircraft investigation methodology."¹⁵³ Sommer also testified during his deposition that "the position of that valve [during the NTSB investigation] is not critical or key to my investigation because of all the other evidence that I have."¹⁵⁴ Further, Seader indicated in his Rebuttal Report that he was skeptical of the NTSB's finding.¹⁵⁵ The best reading of the record is that Plaintiffs' experts did not give much credence to the NTSB investigation, beyond its finding that there was an irregularity with the No. 1 exhaust valve.

Avco's argument as to the experts' testimony regarding the time it took for power loss to occur suffers from the same flaw. First, the radar data is not continuous; it is recorded in "one-to-two-second intervals."¹⁵⁶ Any attempt to

¹⁵² *Id.* at 23, n.9.

¹⁵³ Sommer Rebuttal Report, Doc. 85-2, at 5. Sommer's report can also be read as rejecting only the practice of filling the cylinder with water. At best, this portion of Sommer's report is ambiguous. Clearing up ambiguity during a hearing is not the same as proffering an entirely new opinion.

¹⁵⁴ Sommer Dep., Doc. 72-18, 135:22-136:2.

¹⁵⁵ See Seader Rebuttal Report, Doc. 87-2, at 1 ("During this 'thumb' compression test, cylinders 2, 3, 4 apparently felt adequate, however cylinder #1 felt weak.")

¹⁵⁶ Hr'g Tr. 35:18-24.

determine when power loss occurred down to a precise second is inherently an exercise in futility. Second, the engine test did not reveal that, once the valve's movement was restricted, the engine continued to produce maximum power until a 36% loss occurred after five seconds. It showed that, once the valve was restricted, power loss was immediate and precipitous, *peaking* at a 36% loss.¹⁵⁷ If a 7% power loss would have resulted in the accident under the circumstances, then the Helicopter would be underwater before a 36% power loss could occur. Third, while Sommer testified at the hearing that the Helicopter would experience power loss from a stuck valve more immediately than was measured by Seader's test,¹⁵⁸ he emphasized that whether the power loss occurred within two seconds, six seconds, or anywhere in between, had no effect on his opinion.¹⁵⁹

One of the purposes of a *Daubert* hearing is to give experts a chance to explain and even correct errors that they made in their reports.¹⁶⁰ Insofar as Plaintiffs'

¹⁵⁷ Seader Dep. 219:3-223:25. The Court notes that the torque and horsepower figures discussed during the deposition do not appear to reflect a 36% loss in power. *See id.* 222:15-10 (discussing drop in torque from 264.42 ft/lb, or 135.94 horsepower, to 209.39 ft/b, or 107.65 horsepower, which reflects a 20.81% drop in power). However, Avco has not challenged the data from Seader's test, nor has either party supplied the raw data from the test to the Court. Since Plaintiffs' experts' representation of a 36% loss in power is unchallenged and the Court does not have a complete view of the relevant data, it accepts the Plaintiffs' representation for the purposes of evaluating the pending *Daubert* motions. In all events, substituting a 20% loss in power for a 36% loss in power does not appear to have a material impact on Plaintiffs' experts' accident reconstruction. Based on the figures cited in Seader's deposition, a 7.34% power loss occurs in two seconds, increasing to 9.99% in three seconds, 12.26% in four seconds, 15.29% in five seconds, and finally 20.81% at six seconds. *Id.* 219:3-23.

¹⁵⁸ *E.g.*, Hr'g Tr. 90:15-92:8.

¹⁵⁹ *Id.* at 104:5-10.

¹⁶⁰ *Crowley v. Chait*, 322 F. Supp. 2d 530, 540 (D.N.J. 2004).

experts' testimony is inconsistent with statements they have made in their reports or during their depositions, Avco can address those inconsistencies at trial during cross-examination. The Court finds that any such inconsistencies do not "materially differ" from the opinions the experts have provided throughout the litigation; rather, they are "simply an elaboration on previously disclosed opinions."¹⁶¹

Even if the Court did conclude that the opinions discussed above were improperly disclosed for the first time at the *Daubert* hearing, the Court finds the belated disclosure harmless because the opinions were not so different as to result in any prejudice or surprise to Avco and any prejudice was sufficiently ameliorated by the Court's invitation to the parties to submit supplemental briefing.¹⁶² Avco can explore any perceived inconsistencies at trial on cross examination; they are not a ground to exclude expert testimony altogether.¹⁶³

¹⁶¹ *Cf. Stiffler v. Apple Inc.*, No. 21-CV-523-NR, 2023 WL 1996692, at *5 (W.D. Pa. Feb. 13, 2023) (granting *Daubert* motion as to opinions expert conceded were disclosed for the first time during a *Daubert* hearing).

¹⁶² *See Konstantopoulos v. Westvaco Corp.*, 112 F.3d 710, 719 (3d Cir. 1997) (citing *Meyers v. Pennypack Woods Home Ownership Ass'n*, 559 F.2d 894, 904–905 (3d Cir.1977)) (listing the so-called *Pennypack* factors courts are to consider before excluding evidence: 1) prejudice to the party against whom the witnesses would testify, 2) ability to cure that prejudice, 3) notions of judicial efficiency, and 4) bad faith). The Court also concludes that neither Plaintiffs nor their experts have acted in bad faith.

¹⁶³ *TQ Delta, LLC v. 2Wire, Inc.*, No. CV 13-1835-RGA, 2021 WL 2954356, at *2 (D. Del. July 14, 2021) (citing *Daubert*, 509 U.S. at 596; *Summit 6, LLC v. Samsung Elecs. Co., Ltd.*, 802 F.3d 1283, 1296 (Fed. Cir. 2015); *Schneider ex rel. Est. of Schneider v. Fried*, 320 F.3d 396, 405 (3d Cir. 2003)).

B. Cause of the Accident

Avco argues that Sommer's and Fiedler's opinions that a sticking valve caused the accident should be excluded because they are based on "pure speculation."

1. Fiedler's Reconstruction

In his report, Fiedler asserts that, in his investigation, he followed the "methodology and guidelines found in the NTSB Basic Aircraft Investigation Procedures & Techniques Manual and the International Civil Aviation Organization (ICAO) Manual of Aircraft Accident Investigation."¹⁶⁴

Fiedler described his methodology at the *Daubert* hearing as beginning with an "open mind" and "obtain[ing] whatever factual information you can" "then fine-tun[ing the] investigation, narrowing it down."¹⁶⁵ The investigation employs a "team concept" where specialists such as meteorologists, physiologists, and material scientists conduct sub-investigations.¹⁶⁶ In this case, Fiedler testified that the team evaluated the weather conditions to determine if Knight's flight comported with the relevant regulations and if he had the skill required of such a flight.¹⁶⁷ The team also

¹⁶⁴ A.J. Fiedler Expert Report, Doc 72-3, at 57.

¹⁶⁵ Hr'g Tr. 124:7-10.

¹⁶⁶ *Id.* 124:10-22.

¹⁶⁷ *Id.* 126:3-9.

considered the possibility that weather conditions created a situation where Knight would have experienced spatial disorientation.¹⁶⁸

Plaintiff expert Ronald D. Smith, an Aviation Physiologist, investigated “whether sensory illusions and/or spatial disorientation were involved in the subject aircraft accident.”¹⁶⁹ He concluded 1) Knight “conducted the flight in accordance with SFRA and VFR requirements”; 2) “impaired depth perception cannot be attributed as a factor in this accident”; 3) “[t]he flight dynamics of the accident aircraft do not reflect the predicted pilot response to altitude/height misperception due to a visual illusion, which might have been associated with over-water depth perception problems”; and 4) Knight did not experience spatial disorientation during the accident.¹⁷⁰ Avco has not challenged Smith’s opinion.

Plaintiff expert Lee E. Branscome, a meteorologist with Climatological Consulting Corporation, analyzed the weather conditions and determined that “the Helicopter was not in clouds or fog at the time of the accident.”¹⁷¹ Avco has not challenged Branscome’s opinion. Fiedler adopted the conclusions—that neither spatial disorientation nor weather were factors in the accident—in his report.¹⁷²

¹⁶⁸ *Id.* 126:10-12.

¹⁶⁹ Ronald Smith Expert Report, Doc. 90-1, at 2.

¹⁷⁰ Smith Report 13.

¹⁷¹ Lee E. Branscome Expert Report, Doc. 92-1, at 7.

¹⁷² Fiedler Report at 57 (citing Smith and Branscome Reports).

Having eliminated the above factors, Fiedler then considered whether “there is something mechanically wrong with the Helicopter.”¹⁷³ At this stage, he collaborated with Sommer and “did not see anything with the air frame components that was contrary to Mr. Sommer’s findings.”¹⁷⁴ Fiedler agreed with Sommer that the lack of deformation of the flex couplings to the tail rotor drive shaft “indicates that the system wasn’t being driven by the engine at the time of impact.”¹⁷⁵ The relative lack of damage to the main rotor blades also indicated to Fiedler (and Sommer) “that the engine was not driving the main rotor system at the time of the water impact.”¹⁷⁶ No anomalies were found in the control system or the any of the transmission of drive systems.¹⁷⁷

From there, to determine what caused the loss of power, various powertrain systems and components were analyzed.¹⁷⁸ Fiedler evaluated the emission system, the ignition system, and the fuel system.¹⁷⁹ Each were ruled out.

Turning to the exhaust valve, Feidler testified that “a valve that wouldn’t release from its guide during disassembly indicates valve stickage” which “would result in a loss of power.”¹⁸⁰ Because the valve would not release, it had to be

¹⁷³ Hr’g Tr. 126:10-17.

¹⁷⁴ *Id.* 127:23-128:3.

¹⁷⁵ *Id.* 127:14-20.

¹⁷⁶ *Id.* 128:23-5.

¹⁷⁷ *Id.* 130:10-15.

¹⁷⁸ *Id.* 129:24-130:6.

¹⁷⁹ *Id.* 128:25-129:14.

¹⁸⁰ *Id.* 130:2-6.

“sectioned out of the cylinder head” at which point coke deposits were found that would prevent the valve from releasing from the guide.¹⁸¹ Fiedler was present at the laboratory that tested the deposits and found that they were created by oil coking.¹⁸² The amount of coking present was such that it would prevent the spring from closing entirely.¹⁸³ Fiedler testified that, in his experience, a valve that remains open even a couple thousandths of an inch will result in zero compression.¹⁸⁴

2. Sommer’s Reconstruction

Sommer stated in his report¹⁸⁵ and his testimony¹⁸⁶ that he applied the methodologies established by the ICAO and NTSB, as well as the United States Air Force, United States Navy, Transport Safety Board of Canada, and University of Southern California for aircraft accident investigation.

In his report, during his deposition, and during the *Daubert* hearing, Sommer detailed extensively his investigation of the accident. Sommer determined that Knight was qualified to conduct the subject flight and that he did so in accordance with the relevant regulations.¹⁸⁷ Sommer considered and ruled out human factors as a potential cause.¹⁸⁸ Based on witness statements and the available radar data,

¹⁸¹ *Id.* 130:22-24.

¹⁸² *Id.* 131:4-18.

¹⁸³ *Id.* 133:8-11.

¹⁸⁴ *Id.* at 137:9-13.

¹⁸⁵ Sommer Report 18.

¹⁸⁶ Hr’g Tr. 12:25-13:12.

¹⁸⁷ Sommer Report ¶¶ 1-2; Hr’g Tr. 29:14-31:14.

¹⁸⁸ Sommer Report ¶ 9; Hr’g Tr. 31:15-34:5; Sommer Dep. 121:9-124:14.

Sommer determined that the accident—a sudden departure from controlled flight—would have been caused by “something rapid and relatively catastrophic.”¹⁸⁹ Upon investigating the wreckage, found evidence that the rotor was not being driven at the time of the accident and did not find evidence of any other mechanical issues.¹⁹⁰ Sommer reviewed the NTSB report which found a loss of compression in the No. 1 cylinder.¹⁹¹ Sommer’s investigation of the engine showed evidence of coking on the No. 1 exhaust valve, which was stuck in the guide at the time of the examination.¹⁹² Sommer also reviewed the maintenance records, which showed a downward trend in compression readings for the No. 1 cylinder.¹⁹³

Putting all of this together, Sommer then concluded that the accident resulted from a sudden and significant loss in power and that the condition of the engine was consistent with such a loss in power due to a loss of compression.

3. Analysis

The Court begins its analysis by noting that Avco does not challenge the reliability of any of the methodologies Fiedler and Sommer claim to have applied in this case. Rather, Avco argues that their causation opinions are “not based on any

¹⁸⁹ Hr’g Tr. 34:3-5. *See also* Sommer Report 3-4.

¹⁹⁰ Hr’g Tr. 43:2-47:16; Sommer Dep. 120:21-121:24.

¹⁹¹ *Id.* 48:11-20; Sommer Report 16; Sommer Dep. 129:5-136:2.

¹⁹² Hr’g Tr. 48:8-50:5; Sommer Dep. 129:5-136:2.

¹⁹³ Hr’g Tr. 97:23-98:15.

reliable principles or methodology.”¹⁹⁴ The Court therefore assumes that the methodologies Fiedler and Sommer claim to have applied are reliable;¹⁹⁵ the inquiry is whether Fiedler and Sommer’s conclusions flow from a reliable application of those methodologies.¹⁹⁶

a. Deductive Reasoning Approach

ICAO describes accident investigation as “a systematic process whereby all of the possible causes of an adverse event are evaluated and eliminated until the remaining causes are identified as applicable to that investigation.”¹⁹⁷ “The initial phase of the investigation process should focus on defining and obtaining data relevant to the accident.”¹⁹⁸ The data to be collected is grouped into four categories: accident particulars, meteorological particulars, technical particulars, and human factors particulars.¹⁹⁹ The analysis of this data requires “[r]egular discussions between the various investigation team members.”

¹⁹⁴ E.g., Doc. 65, at 37. Cf. Doc. 110, 10 (arguing “neither Sommer nor Fiedler have reliably applied the principles of accident reconstruction to the facts of this incident”).

¹⁹⁵ The Court notes that courts have repeatedly held the ICAO and NTSB methodologies for aircraft accident investigation to be reliable under Rule 702. See *Ballew v. Standard Aero Bus. Aviation Services, LLC*, No. 2:21-CV-747-JLB-NPM, 2024 WL 245803, at *6 (M.D. Fla. Jan. 23, 2024) (collecting cases ratifying ICAO method); *Pease v. Lycoming Engines*, No. 4:10-CV-00843, 2011 WL 6339833, at *9 (M.D. Pa. Dec. 19, 2011) (“methodology used by NTSB investigators” sufficiently reliable).

¹⁹⁶ Fed. R. Evid. 702(d).

¹⁹⁷ ICAO, *Manual of Aircraft Accident and Incident Investigation*, Doc. 93-1, ¶ 1.1.1.

¹⁹⁸ *Id.* ¶ 1.2.1

¹⁹⁹ *Id.*

As discussed above, both Fiedler and Sommer detail an extensive investigation in which they considered and ruled out several potential causes of the accident. They considered the nature of the flight as recorded by radar data and the accident itself as reported by eyewitnesses and determined that the accident was a sudden departure from level, controlled flight. They considered and ruled out weather conditions as a potential cause. They considered and ruled out human factors as a potential cause.

Turning to the Helicopter itself, they determined from the physical evidence that the rotor was not powered at the time of the accident. Combined with the nature of the Helicopter's sudden descent into the water, Fiedler and Sommer reasoned that there was a sudden, significant loss of power. They investigated the powertrain for issues and found evidence that the No. 1 exhaust valve could not close completely. Based on Seader's test, they determined that the failure of the No. 1 exhaust valve to close would have resulted in a sudden, significant loss of power.

This is precisely the sort of deductive reasoning, or "differential diagnosis" called for by the methodologies applied by Fiedler and Sommer.²⁰⁰ Arguing otherwise, Avco suggests that Fiedler and Sommer "simply chose the very last data point for the accident flight, even though doing so ignores 11 minutes of radar data

²⁰⁰ *Pease*, 2011 WL 6339833, at *6.

showing continuous normal engine operations.”²⁰¹ Not only does the record show that neither Fiedler nor Sommer “simply chose” a moment in time that the engine malfunction occurred, the 11 minutes of radar data showing normal flight is consistent with their conclusion that the loss in power was sudden and significant.

The Court also finds unpersuasive Avco’s tortured reading of Sommer’s deposition testimony.²⁰² Sommer testified that the valve “stuck right before the departure from controlled flight . . . around 16:11:33 [UTC],” the time of the last radar ping.²⁰³ Later, Sommer testified that it took “a couple of seconds . . . the span of around four to six seconds” from the time the No. 1 valve began sticking for the engine to experience a 36% power loss.²⁰⁴

In the contexts it was used by Sommer, the Court does not understand the phrase “a couple of seconds” to mean exactly two seconds.²⁰⁵ Nor is Sommer’s failure to identify a precise moment in time that the valve stuck or that the Helicopter experienced the resulting power loss significant. As discussed above, the radar data is not continuous and Seader’s engine test showed that power dropped precipitously from the moment the valve was stuck until reaching a 36% power loss after four to

²⁰¹ Doc. 65, at 37; *see also id.* at 35 (discussing Fiedler’s finding that the valve stuck at the “apex of, the top of the descent”).

²⁰² *Id.* at 39.

²⁰³ Sommer Dep. 71:11-16. *See also* Doc. 65, at 39 (discussing Sommer’s testimony).

²⁰⁴ *Id.* (citing Sommer Dep. 101:11-102:1).

²⁰⁵ *See id.* (estimating the time from the onset of valve sticking to power loss as “a couple of seconds . . . the span of four to six seconds”).

six seconds.²⁰⁶ Sommer’s test in a similar helicopter showed that even an 8% loss of power would have made it impossible to maintain level flight.²⁰⁷ Therefore, the Helicopter would have suffered a catastrophic loss of power even before the total power loss reached 36%.

b. Conditions After Accident v. Before Accident

Avco faults Fiedler and Sommer for failing to “point to any facts or data indicating that the No. 1 exhaust valve was sticking *before* the descent.”²⁰⁸ Fiedler and Sommer note that the NTSB investigation found that the No.1 cylinder had weak compression because the No. 1 exhaust valve did not close completely. When the parties’ experts conducted their investigation, attempts to push the valve closed were unsuccessful. When the cylinder head was disassembled, each valve except the No. 1 exhaust valve fell out of its guide, as is normal. To remove the valve and guide, the No. 1 exhaust valve was sectioned, and the guide was split open. Buildup, which was determined to be coking, was found on the valve which exceeded the tolerance between the valve and the guide.

The Court is therefore unpersuaded by Avco’s argument that the “conditions . . . consistent with valve stickage”²⁰⁹ found by Fiedler and Sommer “say nothing about the *actual condition* of the No. 1 exhaust valve” prior to or during the

²⁰⁶ *Supra* n.156.

²⁰⁷ *Infra* nn.226-27.

²⁰⁸ *E.g.*, Doc. 110, at 11.

²⁰⁹ Doc. 65, at 35 (quoting Fiedler Dep., Doc. 72-15, 136:8-21).

Helicopter's descent into the water. Avco has not challenged Plaintiffs' materials expert Mark Hood's opinion that "[a] coked oil deposit was present on the No. 1 exhaust valve guide and was thicker than the as-designed nominal radial clearance between the valve stem and the guide and likely resulted in the sticking of the subject No. 1 exhaust valve."²¹⁰ Nor does Avco dispute that oil coking occurs at temperatures of several hundred degrees.²¹¹ The coking could not have occurred after the accident. Therefore, it is no more of a speculative leap to conclude that it was there at the time of the accident than it is to conclude that it must be raining when a man walks into a building dripping wet and carrying an umbrella.²¹²

The Court is also unpersuaded by Avco's argument that Plaintiffs' experts' conclusion is based on the fact of the accident itself.²¹³ As detailed above, Fiedler and Sommer, consistent with the NTSB and ICAO methods of accident investigation, conducted a thorough analysis of the conditions of the flight and the Helicopter. That investigation revealed oil coking on the No. 1 exhaust valve. The coking on the exhaust valve was such that the valve would be prevented from closing entirely, which would result in a loss of compression. As Seader's test demonstrated,

²¹⁰ *Supra* n.142; Mark Hood Expert Report, Doc. 72-16, at 7. *See also* Hr'g Tr. 172:18-23 (Fiedler testifying that he "left the actual determination of the composition of the [coking] to a materials expert; in this case, it was Mark Hood.").

²¹¹ Expert Report of Randall Knuteson, Doc. 72-13, at 38.

²¹² *See* Third Circuit Model Civil Jury Instruction § 1.6 ("If someone walked into the courtroom wearing a raincoat covered with drops of water and carrying a wet umbrella, that would be circumstantial evidence from which you could conclude that it was raining.").

²¹³ Doc. 65, at 36.

that loss in compression would result in an immediate loss of power. Therefore, to the extent that Fiedler is correct about the valve sticking, it follows that the issue would have manifested itself at or near the moment the Helicopter descended.

The Court is unmoved by Avco's suggestion that the valve could not have been sticking because other indicators of valve sticking, such as galling or scoring, were not present.²¹⁴ As Seader observed in his rebuttal report, a stuck valve can result manifest differently depending on the failure mode.²¹⁵ Every possible symptom need not be present for Plaintiffs' experts to conclude that the valve is sticking. Avco can certainly inquire at trial as to how Fiedler and Sommer can be so sure the valve was sticking in the absence of certain indicators, or present its own theory, which may well be correct. But, because the Court finds that Fiedler's and Sommer's opinions that the valve was sticking are the result of a reliable application of the principles of accident investigation and reconstruction, they will be permitted to testify.

c. Reliance on Other Experts

"[I]t is well-settled that one expert may rely upon another expert's opinion in formulating his own."²¹⁶ That is particularly true in instances such as this one, where the applied methodology relies upon a "team concept."²¹⁷ Here, the Court finds by a

²¹⁴ Doc. 110, at 13.

²¹⁵ Seader Rebuttal Report, Doc. 87-2, at 3.

²¹⁶ *Carnegie Mellon U. v. Marvell Tech. Group, Ltd.*, 286 F.R.D. 266, 271 (W.D. Pa. 2012) (citing *Dura Auto. Sys. of Indiana, Inc. v. CTS Corp.*, 285 F.3d 609, 613 (7th Cir.2002)).

²¹⁷ See *Johnson v. Avco Corp.*, 702 F. Supp. 2d 1093, 1101-03 (E.D. Mo. 2010) (denying challenge where accident reconstructionist relied on sub investigations of experts in different fields).

preponderance of the evidence that Fiedler and Sommer are “able to testify to the veracity” of the conclusions of the sub-investigations.²¹⁸ Fiedler and Sommer need not be physiologists or meteorologists themselves to be able to determine whether the results of analyses by such experts are well-supported.²¹⁹ Their reports²²⁰ and testimony²²¹ demonstrate that they did more than “simply ‘parrot’ the ideas of other experts.”²²² Accordingly, the Court finds that Fiedler and Sommer “provided objective reasons for eliminating alternative causes of the accident.”²²³ Moreover, as discussed above, the Court finds that Fiedler’s and Sommer’s “ruling in” the sticking of the No.1 exhaust valve as a cause of the accident flows from the reliable application of sound principles of aircraft accident investigation.²²⁴

The Court does not find significant the conflicts between Plaintiffs’ experts’ opinions identified by Avco.²²⁵ On the contrary, that Sommer reached different

²¹⁸ *St. Paul Fire and Marine Ins. Co. v. Nolen Group, Inc.*, No. CIV.A.02-8601, 2005 WL 1168380, at *9 (E.D. Pa. May 13, 2005).

²¹⁹ *See McReynolds v. Sodexo Marriot Services, Inc.*, 349 F. Supp. 2d 30, 37 (D.D.C. 2004) (expert need not personally write computer code or be master of program to rely on it where he testified that “[w]hen I review the computer output I am able to determine if the programming was performed as I requested and if any significant mistakes were made in the programming”); *Astra Aktiebolag v. Andrx Pharm., Inc.*, 222 F. Supp. 2d 423, 492 (S.D.N.Y. 2002) (finding the expert could testify about work done by colleagues that was based on the expert's designs).

²²⁰ *See, e.g.*, Fiedler Report ¶ D.1. (analysis of weather conditions).

²²¹ *E.g.*, Hr’g Tr. 53:5-12 (Sommer testifying regarding collaboration with Seader on engine test).

²²² *Cf. Torain v. City of Philadelphia*, No. CV 14-1643, 2023 WL 174952, at *5 (E.D. Pa. Jan. 12, 2023) (excluding testimony where expert quoted, without analysis, “essentially word for word” nearly fourteen pages of record evidence).

²²³ *Pease*, 2011 WL 6339833, at *7.

²²⁴ *Id.*

²²⁵ Doc. 110, at 13.

conclusions from certain evidence suggests that he did not simply ratify the opinions of other experts whom he relied upon. To be sure, Avco can explore these differences on cross-examination. However, they are not differences of opinions of the sort that call into question the reliability of the underlying opinions.

The Court also is not persuaded by Avco's argument, raised in a footnote, that Fiedler's conclusion that the subject Helicopter "'can't sustain flight if it is experiencing [an] engine power degradation' of 36%-40% is inadmissible."²²⁶ Avco suggests that Fiedler's opinion is unsupported because it is based on a test performed on a different helicopter several years prior. That the test was performed years ago is, without more, not a basis for excluding an expert's opinion. In the prior test, Sommer determined that a similar helicopter fitted with the same Lycoming engine could not maintain level flight with a 7-8% loss in power.²²⁷ Though it would be preferable if the same test were conducted on a Guimbal Cabri G2 with the same 36% loss in power, that is insufficient to exclude Fiedler's opinion here.

First, as the estimated loss in power here is four-to-five times that was tested by Sommer, the Court finds that it is more likely than not that a similar test run on an exemplar helicopter would yield similar results.

Second, and more importantly, both Fiedler and Sommer explained why a sudden loss in power would result in the departure from controlled flight without

²²⁶ Doc. 65, at 36 n.21.

²²⁷ Fiedler Dep., Doc. 72-15, 112:2-114:6.

relying on the prior test. Fiedler testified that “[i]f you have a decline in power, decline in your RPM, your only recourse is to dramatically lower the collective. Once you lower the collective, you’re taking away your lift, you’re going down.”²²⁸ Sommer testified that, upon an immediate loss in power “the governing system . . . will automatically try to increase engine RPM even though the horsepower availability has been taken away, and the action required by the pilot in order to combat this results in the aircraft’s rotor system being unable to support the weight of the aircraft in this scenario.”²²⁹ Sommer also testified similarly during the hearing, providing more detail, when the Court directly questioned him on the issue.²³⁰ Avco’s suggestion that Sommer testified differently—that the subject Helicopter could be flown at 64% power in straight and level flight—either misconstrues or misunderstands Sommer’s testimony.²³¹ Whether the Helicopter can be flown at 64% power in general is a matter distinct from the impact of an immediate, unexpected 36% loss in power.

C. Alternative Design

In his report, Sommer opines that “[t]he subject O-320-J2A engine is defectively designed in a manner that is dangerous.”²³² He concludes that the design

²²⁸ *Id.* 114:14-20.

²²⁹ Sommer Dep. 104:1-10.

²³⁰ Hr’g Tr. 112:14-115:9.

²³¹ *Cf.* Doc. 65, at 36 n.21 (quoting Sommer Dep. 103:22-104:14).

²³² Sommer Report at 18.

of the cylinder system does not allow for adequate cooling.²³³ In particular, Sommer faults “[t]he Lycoming friction based valve rotation design.”²³⁴ The rotation of the valve in its guide is “critical for proper heat dissipation.”²³⁵ The failure of the valve to rotate results in coking on the valves.²³⁶ The coking then “causes concentrated and excessive temperatures . . . result[ing] in valve stickage and in loss of engine power.”²³⁷

Sommer suggests that the design defect could have been ameliorated by alternative designs.²³⁸ Specifically, Sommer offers the engines of Avco competitor Continental Motors, Inc., which employ a “rotocoil” to reduce the incidence of stuck valves.²³⁹ A rotocoil is a “positive valve rotation system” which incorporates a “mechanical locking engagement much less likely to fail to cause valve rotation.”²⁴⁰

Avco asserts that the Court should preclude Sommer from offering this opinion at trial “because he has not conducted, and cannot point to, any testing or evaluations showing that Continental’s designs are safer or even feasible for installation on a Lycoming O-360-J2A engine.”²⁴¹ Plaintiffs respond that Sommer’s comparison of service histories and review of industry publications for Avco and

²³³ *Id.* at 18-19.

²³⁴ *Id.* at 19 ¶ 6.

²³⁵ *Id.* at 19 ¶ 5.

²³⁶ *Id.* at 18-19.

²³⁷ *Id.* at 19.

²³⁸ *Id.*

²³⁹ *Id.* at 9.

²⁴⁰ *Id.* at 19, 19 ¶ 6.

²⁴¹ Doc. 65, at 40.

Continental engines shows that the Continental design is safer.²⁴² As to feasibility, Plaintiffs point to the fact that Sommer’s proposed alternative design has been used in other similar engines for over half a century.²⁴³ Avco replies that, “[d]espite Plaintiffs’ efforts to dress up the steps Sommer took to evaluate the feasibility of incorporating a Continental rotocoil into a Lycoming cylinder,” his methodology does not satisfy Rule 702.²⁴⁴

1. Feasibility

At the heart of the disagreement between Avco and Plaintiffs is the extent to which Sommer is required to test the proffered alternative design. Avco insists that “in the case of alternative designs, testing is crucial.”²⁴⁵ Plaintiffs maintain that testing is not necessary if “feasibility [c]an be established by showing the proffered alternative design is already used in other similar products.”²⁴⁶

In *Daubert*, the Supreme Court provided a non-exhaustive set of factors for district courts to consider when evaluating the reliability of an expert’s methodology.²⁴⁷ Among those factors are whether an expert’s hypothesis is testable

²⁴² Doc. 94, at 48.

²⁴³ *Id.* at 46.

²⁴⁴ Doc. 110, at 19. The Court notes that the discussion of Sommer’s alternative design opinions during the *Daubert* hearing was relatively limited, Hr’g Tr. 59:1-63:14, and was not addressed by either party in post-hearing supplemental briefing.

²⁴⁵ Doc. 65, at 42 (quoting *Ortiz v. Yale Materials Handling Corp.*, No. CIV 03-3657FLW, 2005 WL 2044923, at *6 (D.N.J. Aug. 24, 2005)).

²⁴⁶ Doc. 94, at 44.

²⁴⁷ *Paoli*, 35 F.3d at 742 (citing *Daubert*, 509 U.S. at 592-595).

and, if so, has been tested.²⁴⁸ However, *Daubert* does not require that an expert's hypothesis be subjected to testing.²⁴⁹ While the Court must consider each factor, no single factor is determinative.²⁵⁰ Avco has not provided, nor has the Court's research turned up any controlling authority establishing a different inquiry for opinions regarding alternative designs. While there may be cases where the testability of an alternative design is determinative, the Court disagrees with Avco to the extent that it suggests that testability is a precondition of admissibility for an expert's alternative design opinion. An expert can demonstrate feasibility of an alternative design by demonstrating that the design is used by other manufacturers.²⁵¹

Avco's characterization of "Sommer's 'verification' process [as] limited to confirming that a Continental rotocoil component could physically be placed into a Lycoming cylinder" somewhat understates Sommer's methodology.²⁵² Conversely, Avco overstates the extent to which Sommer testified that "more complex changes" would be necessary.²⁵³ Sommer testified that, while he did not do any "functional testing" of the Lycoming engine with the Continental rotocoil installed, he noted that

²⁴⁸ *Id.*

²⁴⁹ *See id.* (citing *Daubert*, 509 U.S. at 594) ("[T]he inquiry into whether a particular scientific method is reliable is a flexible one.").

²⁵⁰ *Id.*

²⁵¹ *Jacobson by Jacobson v. BMW of N.A., LLC*, No. CV 02-181, 2006 WL 8435046, at *3 (W.D. Pa. Feb. 22, 2006) (collecting cases).

²⁵² Doc. 65, at 41.

²⁵³ *Id.* The Court notes that Sommer's discussion of "more complex changes" is not part of the exchange cited by Avco, as noted by Plaintiffs. Doc. 94, at 50. Avco clarifies the context of the relevant testimony in its reply brief. Doc. 110, at 20-21.

only “slight” or “minor” modifications would be required to do so and described those modifications.²⁵⁴ Combined with the fact that an Avco competitor has installed rotocoils in their engines for over half a century, the Court finds that Sommer’s opinion regarding the feasibility of doing so in the subject Lycoming engine is reliable.

That is not the end of the inquiry, however. Sommer further testified that, while the installation of the rotocoil would remedy the failure of the exhaust valves to rotate, it “would not be the only alternative design that would be necessary to prevent this type of coking.”²⁵⁵ The other changes that would be required would be to lower the power output of the engine, change the design of the cylinder head from a “parallel valve head” to an “angle valve head,” “the design of the exhaust port itself,” “the extrusion of the valve guide into the exhaust,” and the use of “normal deck cylinders as opposed to the lightweight deck cylinders.”²⁵⁶

Certain of these changes are plainly feasible. The increase in horsepower from 145 to 160 was a post-certification and post-sale modification.²⁵⁷ Lycoming could have simply not released the modification. Lycoming could also have used cylinders

²⁵⁴ Sommer Dep. 144:8-21, 177:19-178:4.

²⁵⁵ *Id.* at 145:3-10.

²⁵⁶ *Id.* at 146:13-19. *See also* Sommer Rebuttal Report at 7 (noting that the temperatures of the “cold side” of a rotating valve still approached coking temperatures).

²⁵⁷ Sommer Report at 6-7. *See also* *Truong v. Delta Intl. Mach. Corp.*, No. CV1919384JRPMS, 2021 WL 5441802 (D.N.J. Oct. 29, 2021) (feasibility confirmed by fact that defendant was already offering alternative design as an optional accessory).

that have larger cooling fins, as opposed to the lightweight cylinders, or otherwise recommended an extended cooldown period.²⁵⁸ Regarding other changes, Sommer offered to discuss them during his deposition.²⁵⁹ Avco declined to take him up on the offer, instead focusing on the fact that Sommer had not personally tested the “very, very similar” methods Continental has employed for decades.²⁶⁰ Nor did Avco question Sommer on the issue during the *Daubert* hearing. Though Avco’s moving brief raises the issue of other more complex changes, it does not substantively discuss them. The Court therefore is left to assume that these other changes are also feasible.²⁶¹

Sommer’s alternative design conclusions are not derived from the sort of “subjective observations and methodologies” that other courts have held insufficient in alternative design cases.²⁶² Sommer has identified the design flaw he believes caused the accident and an alternative design that has been implemented for

²⁵⁸ Sommer Report at 11-12. *See also* Sommer Dep. 150:11-151:7 (discussion regarding testing of the engine with a standard cylinder installed).

²⁵⁹ Sommer Dep. 178:15-17.

²⁶⁰ *Id.* at 178:18-180:10.

²⁶¹ *Cf. In re Johnson & Johnson Talcum Powder Products Mktg., Sales Practices and Products Litig.*, 509 F. Supp. 3d 116, 144 n.20 (D.N.J. 2020) (rejecting argument raised for first time in *Daubert* Motion where moving party neglected to meaningfully cross-examine witness during hearing or discuss in post-hearing brief). *But see Korsing v. U.S.*, No. 16-22190-CIV, 2017 WL 7794276, at *10 (S.D. Fla. Aug. 24, 2017) (burden of establishing reliability rests with party offering testimony, notwithstanding objecting party’s failure to pursue certain lines of questioning during a deposition). The Court emphasizes that its assumption that these other changes are feasible does not rest solely on the fact that Avco declined to question Sommer about them. Rather, where Sommer has offered a sufficient basis for his opinion—that these elements of the alternative design have been incorporated by others for decades—and Avco has not contested it, the Court has no reason to second guess Sommer’s conclusion.

²⁶² *Simmons v. Ford Motor Co.*, 132 Fed. Appx. 950, 952 (3d Cir. 2005).

decades.²⁶³ Though “[n]umerous courts have excluded expert testimony regarding a safer alternative design where the expert failed to create drawings or administer tests,”²⁶⁴ neither drawings or tests are required under *Daubert*. Here, that the proposed alternative design has been employed by the only other manufacturer of similar engines for decades is sufficient to show general acceptance of the design, and that, combined with Sommer’s testing and experience is sufficient in this case to show that the design could be implemented by Avco.²⁶⁵

The Court finds that the testing Sommer did perform, the fact that certain of the changes are plainly feasible, and that the proffered design has been used in the industry for sixty years is sufficient to render Sommer’s opinion regarding the feasibility of the design reliable by a preponderance of the evidence.

2. Safety

Avco avers that Sommer “must provide sufficient support that the alternative component is *both* functionally feasible on the defendant’s product *and* will make

²⁶³ *Cf. id.* at 953 (affirming exclusion of expert testimony where witness could not identify the cause of accident or show that the proposed alternative design was in use by any other manufacturer).

²⁶⁴ *Zaremba v. Gen. Motors Corp.*, 360 F.3d 355, 358-59 (2d Cir. 2004) (collecting cases).

²⁶⁵ *Cf. id.* (affirming exclusion of expert testimony where expert had not shown general acceptance).

the product safer.”²⁶⁶ However, Avco does not meaningfully contest Sommer’s opinion on this point.²⁶⁷

Avco makes a passing reference in its moving brief to industry publications Sommer relies upon, arguing that neither provide the requisite foundation for his opinion that the Continental design is safer. Avco’s argument is not well taken. Sommer also reviewed Lycoming and Continental service bulletins, finding that “Continental historically has not had anywhere near the number of valve-sticking incidents or service bulletins, or advisories, or warnings that Lycoming has because of the overall design.”²⁶⁸ Sommer reviewed Lycoming documents and communications discussing cooling issues experienced by its customers.²⁶⁹ Sommer considered bulletins issued by manufacturers of helicopters similar to the subject Helicopter regarding overheating issues.²⁷⁰ Finally, Sommer’s opinion is based upon his experience working with both Continental and Lycoming engines.²⁷¹ Avco’s suggestion that it is improper for Sommer to rely on publications which are not peer reviewed is unavailing. If those publications were the sole basis for Sommer’s

²⁶⁶ Doc. 110, at 18.

²⁶⁷ After Plaintiffs noted in their opposition that Avco “focused solely on feasibility,” Doc. 94, at 49-50, Avco did not address the issue at all in its reply brief; its references to feasibility and safety are followed by a discussion of only the former.

²⁶⁸ Sommer Dep. 179:6-10.

²⁶⁹ Sommer Report at 12, 14-16.

²⁷⁰ *Id.* at 12-13.

²⁷¹ See Sommer Dep. 51:14-52:12 (discussing participation in Continental training course).

opinion, Avco's argument may have merit. As they were simply two of several resources Sommer considered, that is no basis for exclusion.

The Court also finds unpersuasive Avco's suggestion that the publications are irrelevant or undermine Sommer's opinion. First, the cited portions of the *Sky Ranch Manual* clearly discuss the different designs of the Lycoming and Continental engines.²⁷² Second, Sommer explained during his deposition that the failures of the Continental rotocoils discussed in the AOPA article were attributable to improper service of the engine.²⁷³

Avco's halfhearted argument that Sommer's opinion that the Continental design is safer than the design used by Lycoming is without support is insufficient to call into question the reliability of that opinion.

D. User Expectations

Finally, Sommer opines that "[t]he design of this engine . . . w[as] extremely dangerous and beyond any knowledge or expectation of users of the Helicopter."²⁷⁴ He faults Lycoming for "fail[ing] to take steps to adequately warn users, correct the problem, and report the dangerous problems to regulatory authorities."²⁷⁵ Avco

²⁷² Sommer Report at 8-10. The Court also notes that Avco expert Randall Knuteson relies on the *Sky Ranch Manual* in his report. Doc. 88-2, at 41.

²⁷³ Sommer Dep. 147:1-17.

²⁷⁴ Sommer Report at 19.

²⁷⁵ *Id.*

seeks to preclude such testimony on the grounds that Sommer is impermissibly rendering a legal opinion and that his opinion is without support.

1. Legal Opinions

The Third Circuit has instructed that, in weighing proffered expert testimony, “the District Court must ensure that an expert does not testify as to the governing law of the case.”²⁷⁶ Under Pennsylvania law, a plaintiff pursuing a strict product liability cause of action may establish that a product was defective by showing that “the danger is unknowable and unacceptable to the average or ordinary consumer.”²⁷⁷ This test is known as the “consumer expectations standard.”²⁷⁸

²⁷⁶ *Berkeley*, 455 F.3d at 217.

²⁷⁷ *Tincher v. Omega Flex, Inc.*, 104 A.3d 328, 3335 (Pa. 2014). *See also infra* Section IV.B (discussing Plaintiffs’ strict liability claim).

²⁷⁸ *Id.* at 387. The Court assumes, without deciding, that the consumer expectations test is appropriate in this case. At least one court has held that the test is inappropriate in a similar case. *Cf. Yazdani v. BMW of N.A., LLC*, 188 F. Supp. 3d 486 (E.D. Pa. 2016) (granting motion to preclude use of consumer expectations test in case regarding alleged defective design of air-cooled motorcycle engine). The Court professes some skepticism regarding *Yazdani*’s reasoning. It is not immediately obvious to the Court why the danger of an engine catching fire without warning is beyond the understanding of an ordinary consumer. Nor is it obvious that the fact that the engine in *Yazdani* was an air-cooled engine makes a difference in whether a consumer would be less likely to understand that motorcycle engines should not catch fire. *Cf. id.* at 493 n.3 (“This case, however, does not involve a typical engine; rather, it concerns an air-cooled motorcycle engine.”). *But cf.* Dana Hooshmand, *All the Big, Modern Air-Cooled Motorcycles You Can Still Buy...for now*, motofomo (May 23, 2024), available at <https://motofomo.com/modern-air-cooled-motorcycles/> (listing air-cooled motorcycles which are available on the market, as well as observing that “Harley-Davidson has been known for ‘big air-cooled V-twins’ forever.”). The Court is skeptical that the ordinary consumer would not understand that Harley-Davidson motorcycles should not spontaneously combust. Further, in this case, the Court notes that the type of engine at issue is common among helicopters like the one in this case. On the other hand, if a motorcycle engine is beyond the comprehension of the ordinary consumer, then it seems that a helicopter engine must be as well. Therefore, the Court will assume that the consumer expectation test is appropriate for present purposes but will invite the parties to brief the issue in motions *limine* prior to trial. *See* Doc. 124 at 33-34 (“[S]hould there be any question as to whether the consumer expectation test can be applied

Avco’s argument fails at the first step. “Whether a product is in a defective condition *is a question of fact*,” not a legal conclusion.²⁷⁹ At trial, the jury, not the Court, will be tasked with determining whether the engine did not perform as safely as would be expected by an ordinary consumer.²⁸⁰ The Court will explain the law to the jury, but it will play no other role in determining “whether the risk of exhaust valve sticking ‘is unknowable and unacceptable’ to helicopter pilots.”²⁸¹

Federal Rule of Evidence 704(a) explicitly permits an expert to proffer testimony that “embraces an ultimate issue to be decided by the trier of fact.” If Sommer “provides a solid foundation and explanation on an issue for which the factfinder needs assistance, the factfinder might be left hanging if the witness cannot cap off the testimony with a conclusion about the ultimate issue to which the expert is testifying.”²⁸² This does not mean that Sommer may “merely tell the jury what

in a helicopter crash . . . this issue should be addressed through full briefing at the motion in limine stage.”).

²⁷⁹ *Tincher*, 104 A.3d at 335 (emphasis added).

²⁸⁰ Pa. Suggested Standard Civil Jury Instructions, §16.20 (2020).

²⁸¹ Doc. 110, at 22. At the hearing, the Court inquired whether the consumer expectation test is appropriate here, where the defect at issue is of the sort that would be “known” to the entity or person responsible for maintaining and servicing the helicopter, rather than the pilot. Hr’g Tr. 118:8-14. Plaintiffs suggest, and the Court agrees, that this is an issue best resolved upon full briefing at the motion in *limine* stage. *Supra* n.278.

²⁸² *Krys v. Aaron*, 112 F. Supp. 3d 181, 192 (D.N.J. 2015) (quoting 3 Stephen A. Saltzburg, Michael M. Martin & Daniel J. Capra, Federal Rules of Evidence Manual § 704.02[1] (9th ed. 2006)). *But see* Doc. 65, at 46 (whether a claimed defect renders a product “‘unreasonably dangerous beyond the contemplation of the average consumer . . . is an ultimate legal conclusion which an expert may not draw, as it invades the province of the court and jury”) (quoting *Raley v. Hyundai Motor Co.*, No. CIV-08-0376-HE, 2010 WL 199976, at *7 n.16 (W.D. Okla. Jan. 14, 2010)). With due respect to my colleague in the Western District of Oklahoma, the quoted language appears to this Court to be an incorrect statement of the law. The authority cited in *Raley* held that “the proposed testimony may not go to ultimate issues

result to reach.”²⁸³ However, that the language of Sommer’s report “tracks” language used by courts to describe the legal standard is not a basis to preclude Sommer from testifying as to his opinion at trial.

2. Reliability

The question then is whether Sommer has “provide[d] a solid foundation and explanation” for his opinion.²⁸⁴ Avco notes that “Lycoming has repeatedly provided detailed information to its users about the diagnosis and avoidance of exhaust valve sticking, which is an inherent possibility on all combustion-powered engines,” including the Continental engines which Sommer says employ a safer design.²⁸⁵ Plaintiffs respond that Lycoming’s service publications “do not describe the type of malfunction that occurred in this case,” “lead[ing] users to mistakenly believe that if they simply change their oil at fifty-hour intervals and look for certain symptoms of valve health, that they will be safe.”²⁸⁶ In reply, Avco asserts that “Sommer provides no support for the distinction he draws” between the sort of valve sticking warned against in Lycoming’s service publications and the type of malfunction he says occurred in this case.²⁸⁷

of law governing the jury’s deliberations, as instructions on the law are the function of the court.” *Id.* at *2 (citing *United States Aviation Underwriters, Inc. v. Pilatus Business Aircraft, Ltd.*, 582 F.3d 1131, 1150 (10th Cir. 2009)).

²⁸³ *Krys*, 112 F. Supp. 3d at 192 (quoting Fed. R. Evid. 704, Advisory Committee Notes (1972)).

²⁸⁴ *Id.*

²⁸⁵ Doc. 65, at 46-47.

²⁸⁶ Doc. 94, at 52-53.

²⁸⁷ Doc. 110, at 24.

The Court is unmoved by Avco’s argument that, because coking is an inherent possibility in all combustion engines, the alleged risk of coking identified by Sommer cannot be unknowable. Avco “conflates the question of whether a danger is conceivable with whether an ordinary consumer would reasonably anticipate it.”²⁸⁸ Sommer opines that the Lycoming engine is uniquely susceptible to coking which presents the risk of a failure “seldom seen on Continental engines.”²⁸⁹ Sommer also asserts that Lycoming was aware of the increased risk of valve stickage due to coking and did not communicate it to users.²⁹⁰ Insofar that Lycoming was aware of the increased risk of coking but withheld that information from its customers, that is strong support for the proposition that there was an inherent defect in the subject engine unknowable to consumers.

Avco also asserts that Plaintiffs’ attempts to differentiate the carbon buildup that is warned about in Lycoming service bulletins from oil coking miss the mark. Here, Avco has the better of the arguments.

Lycoming Service Bulletin No. 388C (“SB 388C”) describes a “procedure to determine exhaust valve and guide condition” that is to be completed in “300 hour intervals or earlier if valve sticking [is] suspected.”²⁹¹ It warns that “[f]ailure to

²⁸⁸ *Roamingwood Sewer & Water Assn. v. Natl. Diversified Sales, Inc.*, No. 1:20-CV-00640, 2023 WL 2775149, at *8 (M.D. Pa. Apr. 4, 2023).

²⁸⁹ Sommer Report at 10 (quotation and citation removed).

²⁹⁰ *Id.* at 19.

²⁹¹ Doc. 76-4, at AVCO_008623.

comply with the provisions of this publication could result in engine failure due to excessive carbon build up between the valve guide and valve stem resulting in sticking valves.”²⁹²

Plaintiffs make much of the fact that the “service literature addresses exhaust valve sticking for the wrong reasons.”²⁹³ As Mark Seader testified during the *Daubert* hearing, “all oil coking is carbon, but not all carbon is oil coking.”²⁹⁴ There is nothing in the record which supports Plaintiffs’ conclusion that the procedure in SB 388C would make a user aware of carbon buildup formed from combustion byproducts or oil contamination, but not from oil coking. Plaintiffs’ suggestion that the “wiggle test” described in SB 388C would not alert a user of oil coking at the base of the valve is without support.²⁹⁵ As is Plaintiffs’ suggestion that SB 388C only requires the “wiggle test” be performed if there is evidence of valve sticking. SB 388C’s mandate that its procedure be completed “in 300 hour intervals or earlier [if] valve sticking is suspected” plainly means that it should be performed, at a minimum, every 300 hours, regardless if valve sticking is suspected or earlier if

²⁹² *Id.*

²⁹³ Doc. 94, at 53.

²⁹⁴ Hr’g Tr. 164:14-17.

²⁹⁵ *Cf.* Doc. 94, at 14 n.10 (citing Carlisle Report, Doc. 91-1, at 2). Carlisle does not opine that “the accumulation of oil coking at the base of the valve would not be detected by wiggling the opposite end of the valve.” *Id.* Rather, Carlisle opines that “manufacturer service bulletins . . . are not mandatory” under the relevant regulations and that, because there was no evidence of valve sticking prior to the accident, it would have been “reasonable to defer [SB 388C’s] maintenance procedure.” Carlisle Report at 2.

valve sticking is suspected.²⁹⁶ Plaintiffs’ experts’ attempts to simply read the 300-hour interval out of the procedure are unavailing.

Nevertheless, as Plaintiffs note, compliance with manufacturer service bulletins is not mandatory, notwithstanding any language in a bulletin asserting otherwise.²⁹⁷ Rather, to the extent that Avco was aware of any defect which could result in an engine failure, it was required to report the defect to the FAA.²⁹⁸ Sommer explicitly faults Avco for failing to make such a report.²⁹⁹ Accordingly, the Court finds by a preponderance of the evidence that Sommer’s opinion that the Lycoming O-360-J2A engine suffered from a defect which was dangerous and unknowable to the consumer is reliable.

V. DEFENSE EXPERTS

Plaintiffs filed motions to exclude the opinions of Gregory Feith and Timothy Tucker (collectively “Avco’s Experts”). Broadly, Plaintiffs claim that each of the pair’s opinions suffer from the same defect: they are “derived from an unreliable

²⁹⁶ *Infra* n.413.

²⁹⁷ Applicability and Enforcement of Manufacturer’s Data, FAA Ord. 8620.2B (effective Mar. 15, 2019). The Court notes that Order 8620.2B went into effect mere weeks before the accident. Nevertheless, the previous Order was similar in all relevant respects. Applicability and Enforcement of Manufacturer’s Data, FAA Ord. 8620.2A (effective Nov. 5, 2007, canceled Nov. 5, 2007).

²⁹⁸ 14 C.F.R. § 21.3(c)(10). The Court notes that 14 C.F.R. § 21.3(d)(1)(i) does not require reporting of “[f]ailures, malfunctions, or defects” which Avco determined “[w]ere caused by improper maintenance or use.” However, whether the valve stickage results from improper maintenance or use is a matter of dispute between the parties. For his part, Sommer cites to internal Avco records and communications which suggest that Avco was aware of an issue which was not attributable to improper maintenance or use. Sommer Report at 11-12, 14-16.

²⁹⁹ Sommer Report at 19.

methodology not intended to be used in accident investigation and otherwise impermissibly address [Knight's] state of mind and speculate about what [he] perceived."³⁰⁰ In support, Plaintiffs direct the Court to *Johnson v. Avco Corp.*,³⁰¹ in which the Honorable Catherine Perry excluded Scott Shappell's opinions which he had based on a methodology called Human Factors Analysis and Classification System ("HFACS").³⁰²

Similar to the discussion regarding whether the failure mode proposed by Plaintiffs' is best described as an "intermittently sticking valve," the Court finds that the discussion regarding HFACS is a red herring. Shappell, the witness at issue in *Johnson* and previously offered as an expert witness by Avco here, has been withdrawn. Avco's remaining two witnesses testified that they did not apply HFACS. Tucker testified that he had never heard of it before this litigation,³⁰³ and Feith testified that he does not "categorize [a pilot's actions] the way HFACS would typically categorize them."³⁰⁴ Rather than determine whether either Tucker or Feith did, in fact, use HFACS and then whether HFACS itself is admissible, the Court will simply evaluate the methods both experts applied on their own merits.

³⁰⁰ Doc. 67, Section III (Feith); Doc. 71, Section III (Tucker).

³⁰¹ 701 F. Supp. 2d 1093 (E.D. Mo. 2010).

³⁰² Doc. 67, at 9; Doc. 69, at 7-8; Doc. 71, at 15-16.

³⁰³ Hr'g Tr. 193:11-15.

³⁰⁴ *Id.* 252:14-17.

A. Gregory Feith

As an initial matter, the Court notes that, despite requesting the Court to preclude Feith’s testimony in its entirety, Plaintiffs only challenge conclusions 5-7 of Feith’s Report.³⁰⁵ Avco observes in its opposition, and Plaintiffs did not dispute in their reply, supplemental brief, or at the hearing that Plaintiffs do not take issue with Feith’s conclusions (1) that Knight was in non-compliance with the Monumental Helicopters User Agreement; (2) that Knight, conducting the low-level flight, operated the Helicopter in “weather that was considered marginal VFR at best and more likely IMC as he continued the flight over the Chesapeake Bay;” (3) the Helicopter was flown at low levels in an erratic flight path in poor conditions; and (4) that the nature of the crash is inconsistent with an engine malfunction.³⁰⁶ Therefore, the Court limits its analysis to the contested conclusions:³⁰⁷ (1) Knight’s decision to initiate and continue the flight in conditions beyond his and the Helicopter’s abilities was due to “self-induced pressure” and “continuation bias”; (2) Knight acting as a “spotter”—actively looking for the fishing boat—diverted his

³⁰⁵ Doc. 67, at 4; Doc. 97, at 9 n.3; Doc. 107, at 3.

³⁰⁶ Feith Report at 17.

³⁰⁷ Insofar that Plaintiffs did intend to challenge the entirety of Feith’s report, the failure to correct Avco’s contrary assertion despite three opportunities to do so is, as a practical matter, a concession of the issue. *Progressive Sterilization, LLC v. Turbett Surgical LLC*, No. CV 19-627-CFC, 2020 WL 3071951, at *2 (D. Del. June 10, 2020) (citing *Law v. Medco Research, Inc.*, 113 F.3d 781, 787 (7th Cir. 1997); *Hardy v. City Optical Inc.*, 39 F.3d 765, 771 (7th Cir. 1994)); accord *Transamerica Life Ins. Co. v. Daibes Gas Holdings Atlanta, L.L.C.*, No. CV 18-10869 (SRC), 2021 WL 1541150, at *25 (D.N.J. Apr. 20, 2021).

attention away from operating the Helicopter; and (3) Knight's actions evidenced hazardous "anti-authority and macho attitudes."³⁰⁸

1. Weather Conditions

Central to each of Feith's challenged opinions are the weather conditions at the time of the accident. Feith refers to Avco's weather expert, Dr. Elizabeth Austin, who opined that the "[w]eather conditions in the vicinity of Kent Point included instrument flight rules (IFR) with a cloud ceiling as low as 300 feet above ground level, [and] visibility restrictions due to mist and fog."³⁰⁹ Austin further concluded that the weather conditions "favor[ed] the formation of steam fog over the bay prior to and at the time of the N572MD accident."³¹⁰ Feith also notes that witnesses reported "low cloud ceilings and limited visibility (due to patches of fog that varied in location and density) were present in the area of the accident at the time the N572MD crashed."³¹¹

However, as Plaintiffs note, Feith conceded during the *Daubert* hearing that the altitude of the Helicopter at the time of the accident was well below the 300-foot cloud ceiling as determined by Austin.³¹² Feith suggests that both Austin and Plaintiffs' weather expert, Dr. Lee Branscome, only evaluated the weather

³⁰⁸ *Id.* at 17-18.

³⁰⁹ *Id.* at 10.

³¹⁰ *Id.*

³¹¹ *Id.*

³¹² *See* Hr'g Tr. 261:3-262:5.

conditions “over land” at “ground-based observation points.”³¹³ Feith’s testimony misstates the weather experts’ reports. While both experts rely on information collected by ground-based weather stations, they used that information, as well as other evidence, to reconstruct the weather conditions they believe existed at the location of the crash—that is, over the Chesapeake Bay.³¹⁴ Both Austin and Branscome found that the minimum cloud ceiling was well above the altitude of the Helicopter at the time of the accident.³¹⁵ When confronted with these inconsistencies, Feith suggests that “nobody can say for sure” that the Helicopter was not in “the bottom ragged edge of a cloud.”³¹⁶ In his Report, Feith notes that “[c]louds do not always form parallel to the surface,” and that “FAA visual flight rules (VFR) require that the pilot have a minimum of one-half mile visibility and operate the Helicopter clear of the *lowest* cloud base above the terrain.”³¹⁷ However, Feith fails to point to anything which supports his assertion that Knight encountered a cloud 125 feet below the cloud ceiling.

Feith’s attempt to shift gears and suggest that the Helicopter was flying through “[o]bscuring weather” rather than clouds is unavailing. As Feith noted in his

³¹³ Hr’g Tr. 261:3-12.

³¹⁴ See generally Lee Branscome Expert Report, Doc. 92-1; Elizabeth Austin Expert Report Excerpt, Doc. 107-1.

³¹⁵ See Branscome Report at 7 (concluding that the cloud ceiling was at least 400 feet); Austin Report at 76 (“The weather conditions in the helicopter’s direction of travel (to the south-southwest during the final minute of its low-level flight included a low cloud ceiling as low as 300 feet MSL, flat light, and visibility degraded by mist and areas of patchy fog.”).

³¹⁶ Hr’g Tr. 262:9-14.

³¹⁷ Feith Report at 15.

report, Austin opined that the weather conditions “favored” the formation of fog at the time of the accident. However, though witnesses to the accident stated that they saw the Helicopter fly through fog prior to the accident, Feith acknowledges that no witness stated that the Helicopter was flying through fog at the time of the accident.³¹⁸ Rather, witnesses to the accident testified at depositions that their view of the Helicopter at the time of the accident was unobstructed by fog or any other obscuring weather.³¹⁹ Feith offers no support for his assertion that the witnesses’ “visibility observation[s] are not reflective of the visibility as viewed from an aircraft 100 to 200 feet above the water.”³²⁰

Rule 702 may not require certainty, but Feith’s own testimony confirms that his opinion that the Helicopter was flying through obscuring weather at the time of the accident falls short of Rule 702’s standard for reliability. Feith’s opinion that Knight could have been flying through a cloud is contrary to the record evidence. Even if the conditions for fog formation existed and witness testimony that the Helicopter was in clear air is unrepresentative of the view from the cockpit, Feith’s opinion requires a stacking of inference upon inference that renders it unreliable. Feith’s failure to establish that it is more likely than not that the preconditions for

³¹⁸ Hr’g Tr. 256:3-4.

³¹⁹ Docs. 67-2, 67-3, 67-4, 67-5.

³²⁰ Feith Report at 10.

his opinions occurred also necessarily precludes a finding that any such opinion fits the case by a preponderance of the evidence.

2. Pilot Inattention

Feith opines that the attempt to search for the boat “resulted in a diversion of attention from flying the Helicopter in a stabilized manner at a consistent altitude.”³²¹ According to Feith, flying the Helicopter “would have required his undivided attention, particularly given the weather conditions and restricted visibility.”³²² Plaintiffs argue that Feith’s opinion is “rank speculation.”³²³ In support, Plaintiffs argue that there is no evidence that Knight was actively involved in attempting to “spot” the boats or that the weather conditions were such that the Helicopter would have encountered fog or clouds prior to the crash.

Feith explains that “[s]earch missions and low-level flight operations are significantly different than typical flight operations” as the former “requires the pilot to exercise a high level of discipline, skill, and knowledge to successfully accomplish the mission.”³²⁴ Feith also notes that “[c]ontrolled flight into terrain is the top operational risk when conducting helicopter search and rescue—when an aircraft unintentionally collides with terrain because of poor visibility.”³²⁵

³²¹ Feith Report at 17.

³²² *Id.*

³²³ Doc. 67, at 14.

³²⁴ Feith Report at 13.

³²⁵ *Id.*

Contrary to Plaintiffs’ assertion, that the purpose of the flight was to search for the boats is, though not dispositive, evidence that Charles Knight was actively engaged in looking for them.³²⁶ Even if Knight did not personally scan the Bay for the fishing boats, his relative inexperience, and Matthew Clarke’s complete lack of experience as a spotter working with pilots in “search” flights, makes it more likely that the pair were performing the “mission” contrary to best practices. Plaintiffs hold Feith to too high a standard. Feith need not be certain of his opinion for his testimony to be admissible.³²⁷ Feith opines that “[i]t is more likely than not that Knight participated in searching by visually scanning the area for the boat while he maneuvered the Helicopter at a low level.”³²⁸

However, Feith does not opine that the “search” nature of the flight itself was what caused the accident. Rather, it was the nature of the flight combined with the weather conditions.³²⁹ As discussed above, Feith has failed to establish the factual predicate—that “it is apparent Mr. Knight did not realize he was either about to enter or had already entered a cloud or fog”—that opinion relies upon.³³⁰ Even if Feith could establish beyond a shadow of a doubt that Knight personally participated in looking for the boat, the failure to establish the reliability of the second part of his

³²⁶ *Abrisch v. U.S.*, 359 F. Supp. 2d 1214, 1232 (M.D. Fla. 2004).

³²⁷ *United States v. Mornan*, 413 F.3d 372, 381 (3d Cir. 2005).

³²⁸ Feith Report at 17.

³²⁹ *Id.* at 17 ¶ 5.

³³⁰ *Id.*

causation opinion—the presence of obscuring weather—is fatal. Accordingly, the Court will preclude Feith’s opinion regarding the nature of the flight as it is stated in the conclusion of his report.³³¹

The Court will not, however, at this point preclude Feith from offering testimony regarding the risks of “search and rescue” flights. Plaintiffs do not meaningfully dispute Feith’s opinion that search and rescue flights carry certain risks.³³² Nor do Plaintiffs’ dispute that searching for the fishing boats was the purpose of the flight and that Clarke was actively communicating with the fishermen in furtherance of that goal. Though a close call, the Court finds that these factors distinguish this case from cases of distracted drivers such as those cited by Plaintiffs.³³³ Unlike driving a car, flying a helicopter is not the sort of activity which the average juror would be familiar.³³⁴ Further, the distraction at issue here is not a momentary lapse; it is part and parcel of the nature of the flight itself.

³³¹ *Id.*

³³² In all events, the Court finds that Feith’s opinion on this point is well-supported.

³³³ *E.g.*, *Strong v. U-Haul Co. of Mass.*, No. 1:03-CV-00383, 2006 WL 5164822, at *8-9 (S.D. Ohio Dec. 28, 2006) (rejecting expert opinion that accident was caused by driver distraction as without evidentiary support). *But see Failla v. George's Foods, LLC*, No. 220CV07109BRMJSA, 2023 WL 7298473, at *9 (D.N.J. Nov. 6, 2023) (denying *Daubert* motion as to opinion that tractor-trailer operator exhibited signs of distraction).

³³⁴ *See King v. Cessna Aircraft Co.*, No. 03-20482-CIV, 2010 WL 1980861, at *8 (S.D. Fla. May 18, 2010) (permitting expert to testify regarding distractions in the cockpit and “the unique environment that the pilots were operating in”); *In re Air Crash at Lexington, Kentucky, Aug. 27, 2006*, No. CIV.A. 506CV316-KSF, 2008 WL 2954973, *4 (E.D. Ky. July 30, 2008) (finding that expert testimony would “assist the jury’s understanding of the many factors that [defendant] claims contributed to pilot confusion prior to the crash”).

For the same reasons, the Court also finds that Feith’s testimony will aid the jury. While a jury can understand the dangers posed by such momentary distractions, the unique risks posed by the type of flight in this case is likely beyond the understanding of the average juror.

3. Aeronautical Decision Making and Hazardous Attitudes

In his report, Feith avers that “[p]ilots are exposed to a significant number of Human Factor (HF) issues that can have both a positive and negative influence on pilot decision making.”³³⁵ He suggests that two such Human Factors, “Self-Induced Pressure” and “Continuation Bias,” contributed to “Knight inadvertently fl[y]ing] the Helicopter under control into the bay.”³³⁶

According to Feith, “self-induced pressure is an HF issue that both the NTSB and the FAA have discussed historically as either a casual or contributing factor in aircraft accidents.”³³⁷ “Self-induced pressure in aviation is typically associated with the need to ‘accomplish the mission’ regardless of potential hazards such as weather, terrain, pilot experience, etc.”³³⁸ “Continuation Bias . . . means the ‘unconscious cognitive bias to continue with the original plan in spite of changing conditions.’”³³⁹

³³⁵ Feith Report, Doc. 67-1, at 15.

³³⁶ *Id.* at 16. Plaintiffs refer to these human factors as “internal pressures.” Doc. 67, Section IV.A. Avco takes issue with this characterization. Doc. 97, at 19 n.10. As with other disputes in this case, the precise term used by the parties does not materially impact the analysis.

³³⁷ Feith Report at 16.

³³⁸ *Id.*

³³⁹ *Id.* at 15 (quoting Continuation Bias Definition, SKYbrary (last accessed Mar. 26, 2024), <https://skybrary.aero/articles/continuation-bias>).

Feith opines “Knight’s choice to initiate and then continue the flight into low cloud ceilings, fog, and restricted visibility conditions was likely influenced by self-induced pressure to be successful for Mr. Clarke’s photography mission.”³⁴⁰

The Court agrees with Plaintiffs that that Feith’s conclusions regarding “motivation and internal pressures” “are matters that any lay juror could infer from admissible evidence.”³⁴¹ “Expert testimony is unnecessary—and may even be properly excluded—if people ‘of common understanding, are as capable of comprehending the primary facts and of drawing correct conclusions from them as are witnesses possessed of special or peculiar training, experience, or observation in respect of the subject under investigation.’”³⁴² Lay jurors, without the help of expert testimony, will be able to understand and infer from the evidence concepts such as “internal pressures” and tunnel vision.

The same is true of Feith’s opinion that “Knight was irresponsible in his aeronautical decision-making and exercised both anti-authority and macho attitudes.”³⁴³ Feith avers that these attitudes were “exemplified by [Knight’s] disregard of the Monumental Helicopters’ policies and his overconfidence in conducting the accident flight.”³⁴⁴ Assuming that Knight disregarded his training or

³⁴⁰ Feith Report at 17 ¶ 5.

³⁴¹ Doc. 67, at 13.

³⁴² *United States v. Dewitt*, 943 F.3d 1092, 1096 (7th Cir. 2019) (quoting *Salem v. U.S. Lines Co.*, 370 U.S. 31, 35 (1962)).

³⁴³ *Id.* at 18 ¶ 7.

³⁴⁴ *Id.* at 16.

Monumental policies—a contention Plaintiffs dispute—lay jurors are more than capable of concluding that an individual who flaunts the rules possesses anti-authoritarian or macho attitudes.

The Court is cognizant that self-induced pressure, continuation bias, and anti-authority and macho attitudes are terms of art which are used in the fields of pilot training and aircraft accident investigation. That alone, however, is insufficient to meet the Rule 702 standard.³⁴⁵ It remains that, in this case, Feith’s analysis as to Knight’s decision making and attitudes is of the sort that is reserved for the jury.

B. Timothy Tucker

Plaintiffs challenge three opinions offered by Avco expert witness Timothy Tucker: 1) Knight’s decision to proceed with the flight was unduly influenced by external pressures; 2) Knight flew into the water because he was unable to perceive a discernible horizon; and 3) the search for the fishing boats distracted Knight from focusing on piloting the Helicopter.³⁴⁶

1. External Pressures

In relevant part, Tucker opines that the pressure he felt to find the boat and not let Clarke down influenced Knight’s decision to commence and then continue

³⁴⁵ *In re Human Tissue Products Liab. Litig.*, 582 F. Supp. 2d 644, 668 (D.N.J. 2008). *See also Colon ex rel. Molina v. BIC USA, Inc.*, 199 F. Supp. 2d 53, 80 (S.D.N.Y. 2001) (that theory has been put to some non-judicial use insufficient to satisfy Rule 702).

³⁴⁶ Doc. 71, at 4-6. The Court notes that Plaintiffs refer to the “external pressures” as “internal pressures.” *Id.* Further, Tucker, like Feith, offers several opinions which Plaintiffs have not contested. The Court confines its analysis accordingly.

the flight.³⁴⁷ Tucker states that “[d]ealing with these external pressures to complete a flight is a well-known risk within the helicopter community, especially on photo flights.”³⁴⁸ Plaintiffs argue that Tucker’s opinion is unreliable because he “merely identifies the existence of the get-the-job-done phenomenon as being ‘well known’ in the helicopter piloting world” then “automatically ascribes the phenomenon to the pilot of the subject flight.”³⁴⁹ They maintain that “there is no way to test Mr. Tucker’s hypothesis or ascribe any objectifiable criteria (such as rate of error and controlling standards) to the technique.”³⁵⁰ Avco responds that Tucker’s opinion flows from his “consideration of the FAA’s safety instructions and guidelines, including its instruction that Knight evaluate any external pressures that could impact safe flight.”³⁵¹ Plaintiffs reply that Avco misses the point; whether the risks posed by external pressures are “subjects addressed in the aviation industry . . . is irrelevant to the inquiry” of whether Tucker’s testimony satisfies Rule 702.³⁵² The Court agrees.

Avco suggests that “Plaintiffs purposefully misinterpret Tucker’s report, which . . . does not attempt to assess Knight’s personal motivation for carrying out

³⁴⁷ Tucker Report, Doc. 71-1, at 11 ¶ 4.

³⁴⁸ *Id.*

³⁴⁹ Doc. 71, at 11.

³⁵⁰ *Id.*

³⁵¹ Doc. 99, at 15.

³⁵² Doc. 109, at 5.

the accident flight.”³⁵³ Far from a misinterpretation, Plaintiffs’ understanding of Tucker’s report flows from a plain reading of his conclusions that “increased pressure to ‘get the job done’ . . . influenced Mr. Knight’s decision[s],” and that Knight “did not want to let a passenger/friend down.”³⁵⁴

Whether Knight was aware of the risks posed by external pressures, the FAA PAVE checklist, or the FAA’s aeronautical decision-making process says nothing about whether external pressures, or any other risk, manifested itself. On the contrary, it can just as easily lead to the opposite conclusion: Because Knight knew that he should not fly under the influence of external pressures, it follows that, having decided to fly, Knight was not subject to any external pressures.³⁵⁵ The fact that pilots take risks when subject to pressures from passengers or “to get the job done” is not a basis to conclude that Knight did so in this case.³⁵⁶

Tucker’s conclusion also begs the question whether Knight understood that he should not have taken off or continued the flight once airborne or that he would

³⁵³ Doc. 99, at 13.

³⁵⁴ Tucker Report at 11 ¶ 4.

³⁵⁵ See D. Sommer Rebuttal Report, Doc. 89-2, at 7 (“Without any record of recent examination by an instructor or examiner, the only indication of what Pilot Knight’s skills were at the time can only be gleaned from his own determination that he had the requisite abilities and was comfortable in conducting the flight.”). The Court emphasizes that its reference to Donald Sommer’s opinion should not be understood as an endorsement. It appears to the Court that the elder Sommer’s reasoning suffers from the same flaw. However, Avco has not challenged Donald Sommer’s opinions.

³⁵⁶ *Johnson*, 702 F. Supp. 2d at 1108 (excluding expert testimony based on studies showing “sometimes people take risks when they are eager to get home, and sometimes passengers put pressure on pilots”).

not have absent any external pressures. That Knight was trained to and should have conducted a self-assessment prior to the flight does not mean he did so. Tucker notes that Knight told another pilot the morning of the flight that he was conducting an IFR flight, despite such a flight being beyond the capabilities of Knight and the Helicopter.³⁵⁷ Tucker also faults Knight for not following the requirements of Monumental Helicopter's Aircraft Use Agreement or receiving a weather briefing.³⁵⁸ According to Tucker then, Knight's decision making was flawed for reasons that have nothing to do with any external pressure. There are any number of reasons Knight may have exercised poor decision making; he may have felt pressured by Clarke, or he may have simply been overconfident or careless. Tucker fails to explain why he is better situated to draw that conclusion than a jury.³⁵⁹

That is also what distinguishes this case from *Sikkelee v. Precision Airmotive Corporation*.³⁶⁰ The decisional errors in *Sikkelee* stemmed from the pilot's inexperience, ignorance of the risks of flying in mountains, and unfamiliarity with the accident aircraft.³⁶¹ Those phenomena, and how they may impact a pilot's

³⁵⁷ Tucker Report at 5.

³⁵⁸ *Id.* at 10-11 ¶¶ 1-2.

³⁵⁹ *See U.S. v. Han*, 637 F. Supp. 3d 527, 550 (N.D. Ill. 2022), *aff'd*, 105 F.4th 986 (7th Cir. 2024) (job of determining state of mind properly left to jury); *In re 3M Combat Arms Earplug Products Liab. Litig.*, No. 3:19MD2885, 2021 WL 948839, at *10 (N.D. Fla. Mar. 13, 2021) (collecting cases); *In re Motor Fuel Temperature Sales Practices Litig.*, 2012 WL 380159, at *7 (D. Kan. Feb. 6, 2012) ("An expert witness may not speculate as to the intent or motives of parties or others.").

³⁶⁰ No. 4:07-CV-00886, 2021 WL 392101 (M.D. Pa. Feb. 4, 2021).

³⁶¹ Doc. 125, at 28-29 (citing expert report at issue in *Sikkelee*).

decision making, are beyond the understanding of an ordinary juror. Indeed, that the pilot himself was apparently unaware of certain risks practically confirms as much. Conversely, how pressure to perform for a friend informs decision making is universal to anyone who might sit on a jury, not just helicopter pilots.

Therefore, Tucker will not be permitted to testify that external pressures influenced Knight's decision to commence and then continue the flight. Tucker may, however, offer testimony regarding the "well-known" risks presented by external pressures and how pilots are trained to manage those pressures. Tucker may not offer testimony that any such pressure actually manifested itself.

In so holding, the Court disagrees with Plaintiffs' position expressed during the hearing that allowing such testimony would not be unduly prejudicial because it would invite the jury to engage in speculation.³⁶² Though the jury is not allowed to speculate, it is permitted to draw reasonable inferences from the evidence.³⁶³ Based on the record before the Court, it appears that there is sufficient admissible evidence from which a jury could reasonably infer that Knight felt pressured to fulfill a promise to a friend. To the extent that a jury draws that inference, his decision to fly despite his training is probative evidence that Knight was willing to conduct and continue a flight beyond his abilities or otherwise contrary to his training.

³⁶² Hr'g Tr. 270:10-23.

³⁶³ *U.S. v. Ji*, No. 18 CR 611, 2022 WL 3081868, at *5 (N.D. Ill. Aug. 3, 2022), *aff'd sub nom. U.S. v. Chaoqun*, No. 23-1262, 2024 WL 3355141 (7th Cir. July 10, 2024).

2. Ability to Perceive Horizon

Tucker also opines that the “accident was caused when a non-instrument rated pilot flying a non-instrument certified helicopter encountered instrument flight conditions (no well-defined horizon) over a large body of water with no useable visual references in sight.”³⁶⁴ Tucker states that “Knight’s low-level maneuvering over calm water without a well-defined horizon and no visible landmarks” is contrary to best practices under the circumstances.³⁶⁵ Plaintiffs argue Tucker’s opinion is unreliable because it “permits the mere existence of an adverse weather condition to serve as the lynchpin to causation.”³⁶⁶ Avco responds that “Tucker’s report explains in detail the evidence supporting his opinions,” and offers facts stated in the report that it says “taken together, allowed Tucker to reasonably conclude that Knight lacked the visual reference points needed to maintain proper aircraft orientation” under the circumstances.³⁶⁷ Plaintiffs reply that Avco merely “string[s] together unrelated opinions Mr. Tucker’s report expresses and present[s] them to fill the analytical gap Plaintiffs argue exists.”³⁶⁸ While the eight topics listed in Avco’s response “are addressed in Mr. Tucker’s report, other than the weather conditions

³⁶⁴ Tucker Report at 11 ¶ 6.

³⁶⁵ *Id.* at 11-12 ¶ 6.

³⁶⁶ Doc. 71, at 15.

³⁶⁷ Doc. 99, at 17-19.

³⁶⁸ Doc. 109, at 11.

. . . they are not presented in the report as the basis for the opinion that Mr. Knight flew the Helicopter into the water because he could not see the water.”³⁶⁹

When asked to respond to Plaintiffs’ argument that his opinion was “based solely on the existence of . . . conditions which might lead to a visual illusion,” during direct examination at the *Daubert* hearing, Tucker disputed only that “a visual illusion happened here.”³⁷⁰ He did not meaningfully respond to the charge that his opinion was based on the mere existence of adverse weather conditions. On cross examination, Tucker testified that “it was absolutely impossible” for Knight to fly the Helicopter in those conditions; “eventually, with all of the maneuvering that he was doing, he was either going to find a boat or fly into the water.”³⁷¹ He further testified that his opinion was based on his experience flying in similar conditions, as well as an exemplar flight he conducted, during which he “had difficulty maintaining altitude at that low level and at a high speed.”³⁷²

The Court notes that Tucker’s spatial disorientation opinion does not suffer from the same defect as Gregory Feith’s similar opinion. Whereas Feith’s opinion turned on whether Knight flew through obscuring weather such as a cloud or fog, Tucker emphasizes that his opinion does not.³⁷³ The Court also notes that, of the

³⁶⁹ *Id.* at 11-12.

³⁷⁰ Hr’g Tr. 201:20-202:4.

³⁷¹ *Id.* 220:21-25.

³⁷² *Id.* 223:19-224:15.

³⁷³ *Id.* 219:8-17.

evidence in Tucker’s report that Avco says supports his opinion, only the weather conditions and Tucker’s exemplar or reconstruction flight are offered as a basis for Tucker’s conclusion on this specific point.³⁷⁴

The question then is whether Tucker’s experience in similar weather conditions and the difficulties he experienced in recreating Knight’s flight in more suitable weather is a sufficient basis for Tucker’s opinion. Though the question is a close one, the Court finds, with one caveat, that Tucker’s opinion satisfies Rule 702.³⁷⁵ The Court takes issue with the degree of certainty to which Tucker expresses his opinion. In his report, Tucker concludes that, under the circumstances, “maintaining proper aircraft orientation was impossible.”³⁷⁶ When pressed on this point during the hearing, Tucker emphasized that he believed that the crash was inevitable—Knight “was either going to find a boat or fly into the water.”³⁷⁷

The Court is reminded of the Infinite Monkey Theorem—an infinite number of monkeys typing for an infinite period will eventually produce the works of

³⁷⁴ Cf. Doc. 99, at 17-19 (listing evidence). Though the reconstruction flight was not mentioned as a basis for Tucker’s spatial disorientation flight in his report, he testified that his opinion was based on the reconstruction flight, plus his experience in similar weather conditions. *Supra* n.370.

³⁷⁵ See *Specter v. Texas Turbine Conversions, Inc.*, No. 3:17-CV-00194-TMB, 2020 WL 7234369, at *3-4 (D. Alaska Dec. 8, 2020) (rejecting challenge to testimony of three experts regarding special disorientation where opinions were supported by experience and review of accident data); *Langenbau v. Med-trans Corp.*, 167 F. Supp. 3d 983, 1001 (N.D. Iowa 2016) (“practical experience with the weather conditions that may cause ‘spatial disorientation’ to a pilot” as well as personal experience with the phenomenon and expert’s examination of flight data sufficient to render opinion admissible).

³⁷⁶ Tucker Report at 12 ¶ 6.

³⁷⁷ Hr’g Tr. 220:21-25.

Shakespeare. Even the most experienced and talented helicopter pilot will crash eventually. Conversely, even Knight was able to fly the Helicopter for a period. Further, the longer a flight continues, the more likely it becomes that it may end abruptly for a different reason entirely such as, for instance, a stuck exhaust valve.³⁷⁸

The question then is whether Tucker's overconfidence warrants precluding his testimony in its entirety. While it is well-established that an expert need not be certain of their conclusion to offer testimony, there is limited caselaw regarding how to approach cases where an expert is *too* certain of their conclusion. The caselaw that does exist suggests that the proper remedy is to simply limit Tucker's testimony rather than preclude it altogether.³⁷⁹ Accordingly, the Court will permit Tucker to offer testimony consistent with his opinion, provided he does not testify on direct examination to any specific degree of certainty.³⁸⁰

³⁷⁸ The Court notes that Tucker separately concludes that a loss of engine power did not cause the accident. Tucker Report at 12. Plaintiffs have not challenged this opinion.

³⁷⁹ See *Kogut v. Cnty. of Nassau*, 894 F. Supp. 2d 230, 244 (E.D.N.Y. 2012), *aff'd in part sub nom. Restivo v. Hessemann*, 846 F.3d 547 (2d Cir. 2017) (experts permitted to testify except as to their views that their opinions "are matters of 'scientific certainty'"); *U.S. v. Glynn*, 578 F. Supp. 2d 567, 574-75 (S.D.N.Y. 2008) (because "ballistics identification" of bullets and firearms is not scientific, expert testimony limited to testifying that firearms match was "more likely than not"); accord *U.S. v. Johnson*, No. (S5) 16 CR. 281 (PGG, 2019 WL 1130258, at *21 (S.D.N.Y. Mar. 11, 2019), *aff'd*, 861 F. App'x. 483 (2d Cir. 2021) (collecting cases).

³⁸⁰ See *U.S. v. White*, No. 17 CR. 611 (RWS), 2018 WL 4565140, at *3 (S.D.N.Y. Sept. 24, 2018) (permitting expert testimony with the limitation that expert not testify to degree of certainty). As in *White*, Tucker may state his personal belief on the issue if pressed on cross-examination.

3. Pilot Inattention

As with Feith, Plaintiffs seek to exclude Tucker’s “opinion that the pilot was distracted because he actively searched for a particular fishing boat.”³⁸¹ In seeking to preclude Tucker’s testimony on the issue, Plaintiffs overstate the extent that Tucker opines that Knight was “distracted” by “looking out” for the boat. During the hearing, Plaintiffs’ counsel appeared to be satisfied that Tucker’s clarification that his “opinion is that the flight profile increased workload”—not that Knight “stopped paying attention to his piloting duties”—remedied any perceived issues regarding admissibility.³⁸² Plaintiffs have also not meaningfully revisited the issue in their supplemental brief. Therefore, the Court will deny Plaintiffs’ Motion on this issue as moot.

C. Rebuttal

The Court briefly addresses Avco’s argument that Feith’s and Tucker’s human factors opinions are admissible because Plaintiffs’ experts made Knight’s character and state of mind central to their case. This argument is unavailing for two reasons.

Sommer that “Knight complied with the FAA’s ‘standard of care,’ demonstrated ‘good judgment,’ and in no way caused or contributed to the accident.”³⁸³ The “human factors” analysis conducted by the Sommers does not include discussion of internal or external pressures or hazardous attitudes is absent from Donald Sommer’s report and Colin Sommer’s affidavit. Both discuss only Knight’s “awareness for the airspace designations” and the weather conditions, ruling out pilot error.³⁸⁴ Donald Sommer’s opinion that Knight demonstrated good judgment is offered to rebut the opinion of Scott Shappell, who is no longer being offered as an expert.³⁸⁵

Second, where the Court precluded testimony by Feith and Tucker, it did so under Rule 702, not Rule 404.³⁸⁶ Even if Plaintiffs’ experts did make Knight’s character and state of mind central to the case, any expert opinion evidence that Avco seeks to admit under Rule 404(b) must still meet the requirements of Rule 702.³⁸⁷

VI. SUMMARY JUDGMENT

Having resolved the pending *Daubert* Motions, the Court turns to Avco’s Motion for Summary Judgment.

³⁸³ Doc. 125, at 34 (citing D. Sommer Report, Doc. 89-1 at 9-10; D. Sommer Rebuttal Report, Doc. 89-2, at 7; C. Sommer Decl., Doc. 85, at 6-8).

³⁸⁴ D. Sommer Report at 9-10; C. Sommer Decl. at 6-8.

³⁸⁵ D. Sommer Rebuttal Report at 7.

³⁸⁶ *Cf. Kula v. U.S.*, No. 4:17-CV-02122, 2021 WL 1600140, at *4 (M.D. Pa. Apr. 23, 2021) (noting that character evidence “that would otherwise be inadmissible under Rule 404 may be admitted to rebut the opposing party’s position on a particular issue”).

³⁸⁷ The Court notes that Avco has not raised a *Daubert* challenge to any of Plaintiffs’ experts’ human factors analyses. Therefore, whether those analyses meet the Rule 702 standard is not an issue before the Court.

A. Standard of Review

Under Federal Rule of Civil Procedure 56(a), summary judgment is appropriate where “the movant shows that there is no genuine dispute as to any material fact and the movant is entitled to a judgment as a matter of law.” As expressed by the Supreme Court of the United States in *Celotex Corp. v. Catrett*, summary judgment is required where a party “fails to make a showing sufficient to establish the existence of an element essential to that party’s case” on an issue that the “party will bear the burden of proof at trial.”³⁸⁸ Material facts are those “that could alter the outcome” of the litigation, “and disputes are ‘genuine’ if evidence exists from which a rational person could conclude that the position of the person with the burden of proof on the disputed issue is correct.”³⁸⁹

The party requesting summary judgment bears the initial burden of supporting its motion with evidence from the record.³⁹⁰ When the movant properly supports its motion, the nonmoving party must then show the need for a trial by setting forth “genuine factual issues that properly can be resolved by only a finder of fact because they may reasonably be resolved in favor of either party.”³⁹¹ The United States Court of Appeals for the Third Circuit explains that the nonmoving party will not withstand

³⁸⁸ 477 U.S. 317, 322 (1986).

³⁸⁹ *EBC, Inc. v. Clark Bldg. Sys., Inc.*, 618 F.3d 253, 262 (3d Cir. 2010) (quoting *Clark v. Modern Grp. Ltd.*, 9 F.3d 321, 326 (3d Cir. 1993)).

³⁹⁰ *Celotex*, 477 U.S. at 323.

³⁹¹ *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 250 (1986).

summary judgment if all it has are “assertions, conclusory allegations, or mere suspicions.”³⁹² Instead, it must “identify those facts of record which would contradict the facts identified by the movant.”³⁹³

In assessing “whether there is evidence upon which a jury can properly proceed to find a verdict for the [nonmoving] party,”³⁹⁴ the Court “must view the facts and evidence presented on the motion in the light most favorable to the nonmoving party.”³⁹⁵ Moreover, “[i]f a party fails to properly support an assertion of fact or fails to properly address another party’s assertion of fact as required by Rule 56(c),” the Court may “consider the fact undisputed for purposes of the motion.”³⁹⁶ Finally, although “the court need consider only the cited materials, . . . it may consider other materials in the record.”³⁹⁷

B. Product Liability

Under Pennsylvania law, a plaintiff bringing a claim of strict product liability “must establish: (1) that the product was defective; (2) that the defect was a

³⁹² *Betts v. New Castle Youth Dev. Ctr.*, 621 F.3d 249, 252 (3d Cir. 2010).

³⁹³ *Port Auth. Of N.Y. and N.J. v. Affiliated FM Ins. Co.*, 311 F.3d 226, 233 (3d Cir. 2002) (quoting *Childers v. Joseph*, 842 F.2d 689, 694-95 (3d Cir. 1988)).

³⁹⁴ *Liberty Lobby*, 477 U.S. at 252 (quoting *Schuylkill & Dauphin Imp. Co. v. Munson*, 81 U.S. 422, 448 (1871)).

³⁹⁵ *Razak v. Uber Technologies, Inc.*, 951 F.3d 137, 144 (3d Cir. 2020).

³⁹⁶ Fed. R. Civ. P. 56(e)(2); *see also Weitzner v. Sanofi Pasteur Inc.*, 909 F.3d 604, 613-14 (3d Cir. 2018).

³⁹⁷ Fed. R. Civ. P. 56(c)(3).

proximate cause of the plaintiff's injuries; and (3) that the defect causing the injury existed at the time the product left the seller's hands.”³⁹⁸

1. Defect

The first element may be proved either “by showing [by a preponderance of the evidence] either that (1) the danger is unknowable and unacceptable to the average ordinary consumer, or that (2) a reasonable person would conclude that the probability and seriousness of harm caused by the product outweigh the costs of taking precautions.”³⁹⁹ The former test is known as the “consumer expectation test”; the latter the “risk-utility test.”⁴⁰⁰ Under either standard, “whether a product is defective ‘is a question of fact ordinarily submitted for determination to the finder of fact; the question is removed from the jury's consideration only where it is clear that reasonable minds could not differ on the issue.’”⁴⁰¹

a. Consumer Expectation Test⁴⁰²

Under the consumer expectation test, a “product is in a defective condition if the danger is unknowable and unacceptable to the average or ordinary consumer.”⁴⁰³ “The test has been described as reflecting the ‘surprise element of danger.’”⁴⁰⁴ “The

³⁹⁸ *Pavlik v. Lane Ltd./Tobacco Exporters Intern.*, 135 F.3d 876, 881 (3d Cir. 1998).

³⁹⁹ *Tincher*, 104 A.3d at 335.

⁴⁰⁰ *Id.* at 368.

⁴⁰¹ *Sikkelee v. Precision Airmotive Corp.*, 907 F.3d 701, 716 (3d Cir. 2018) (quoting *Tincher*, 104 A.3d at 335).

⁴⁰² The Court assumes that the consumer expectation test is applicable. *Supra* n.260.

⁴⁰³ *Tincher*, 104 A.3d at 387.

⁴⁰⁴ *Id.* (citation removed).

nature of the product, the identity of the user, the product’s intended use and intended user, and any express or implied representations by a manufacturer or other seller are among considerations relevant to assessing the reasonable consumer’s expectations.”⁴⁰⁵

Avco insists that the “so-called defects identified by Sommer are nothing more than known characteristics of combustion-powered aircraft engines, all of which carry the possibility of exhaust valve sticking . . . during normal operations.”⁴⁰⁶ Plaintiffs’ respond by directing the Court to the recent decision of my friend and colleague, the Honorable Jennifer P. Wilson, in *Roamingwood Sewer & Water Association v. National Diversified Sales, Inc.*⁴⁰⁷ In *Roamingwood*, Judge Wilson rejected an argument that a sewer valve which caused a sewer leak was not defective under the consumer expectations test because the risk of a sewage spill is not an unknowable danger associated with sewer systems.⁴⁰⁸ Judge Wilson reasoned that to accept this argument would be “to say that said consumer expects [the valve] not to work at all.”⁴⁰⁹ Avco avers that *Roamingwood* is distinguishable because users of the O-360-JA engine know and expect exhaust valve sticking may occur if recommended maintenance procedures are not followed.⁴¹⁰

⁴⁰⁵ *Id.*

⁴⁰⁶ Doc. 74, at 42.

⁴⁰⁷ Doc. 96, at 29-30 (citing No. 1:20-CV-00640, 2023 WL 2775149 (M.D. Pa. Apr. 4, 2023)).

⁴⁰⁸ 2023 WL 2775149, at *8.

⁴⁰⁹ *Id.*

⁴¹⁰ Doc. 111, at 24-25.

The issue is not simply whether there is a risk of exhaust valve sticking, but whether the O-360-J2A carried an unknowable and unacceptable risk of *premature* valve sticking.⁴¹¹ To the extent that there is a risk of premature valve sticking, that suffices to show, at least at summary judgment, that the risk is unknowable; a risk of premature failure can be described as the risk of failure before a user could reasonably expect it.⁴¹²

Avco suggests that Lycoming service publications are sufficient to alert users to the risk of exhaust valve sticking. With the exception of Service Bulletin 388C, the Court agrees with Plaintiffs that these bulletins are largely inapplicable to the purported failure mode in this case. Instructions to clean or inspect the valves if certain conditions are present are insufficient to warn users of a failure mode that occurs in the absence of any of those conditions.⁴¹³ For instance, warning against the dangers of running the engine in high ambient temperatures and instructing users to

⁴¹¹ See Doc. 96, at 25-26 (noting that the claimed defect is that the engine is prone to “the *accelerated* accumulation of oil coking”).

⁴¹² See *Smith v. Spectrum Brands, Inc.*, No. CV 21-4983, 2022 WL 3457822, at *3 (E.D. Pa. Aug. 17, 2022) (potentially premature failure sufficient for claim under consumer expectations test to survive summary judgment); *Lewis v. Lycoming*, No. CIV.A. 11-6475, 2015 WL 3444220, at *4 (E.D. Pa. May 29, 2015) (potentially premature failure of aircraft engine sufficient to survive summary judgment).

⁴¹³ See Service Instruction 1425A, Doc. 76-4 at AVCO_015666-69, at 2 (instructing users to conduct regular oil changes and inspect and clean valves if a) high ambient temperatures; b) slow flight with reduced cooling; or c) high lead content fuel, are present); Service Instruction No. 1080C, Doc. 76-4 at MH_000368-70, at 2-3 (identifying fuel with a high lead content, dusty conditions, and oil contaminants as causes of valve sticking); Service Letter L197A, Doc. 76-4, at MH-000400-01, at 1-2 (cautioning against “ground running” of engine, overheating, rapid cool down or shut down, and advising the importance of clean air filters and regular oil changes).

conduct additional inspections and cleaning if the engine is run in such circumstances does nothing to alert a consumer who operates their Helicopter in the relatively temperate climate of coastal Maryland to a potential risk.

Service Bulletin 388C, however, directs all users to inspect the exhaust valves in “300 hour intervals or earlier if valve sticking is suspected.”⁴¹⁴ Plaintiffs offer two arguments for their position that SB 388C is insufficient to put O-360-J2A users on notice of the risk of valve sticking. First, Plaintiffs argue that SB 388C is insufficient to put users on notice of a potential defect. As discussed above regarding Sommer’s related opinion, Plaintiffs have argued that, to the extent that there was a defect, Avco was obligated to report that to the FAA; service bulletins are insufficient. Because the Court has found that Sommer’s related opinion is admissible, Plaintiffs have produced sufficient admissible evidence to survive summary judgment. Accordingly, the Court need not address Plaintiffs’ argument that the language can be read as requiring inspection only if valve sticking is suspected.⁴¹⁵

⁴¹⁴ Service Bulletin 388C, at 1.

⁴¹⁵ The Court nevertheless notes that it does not find Plaintiffs’ argument persuasive. While Plaintiffs are correct that, as a general matter, a “battle of experts” cannot be resolved at summary judgment, the Court is not obligated to credit an expert opinion which no reasonable jury could believe. *Osagie v. Borough of State College*, No. 4:20-CV-02024, 2023 WL 8191092, at *12 (M.D. Pa. Nov. 27, 2023). *See also Reckitt Benckiser Inc. v. Tris Pharma, Inc.*, No. CIV.A. 09-3125 FLW, 2011 WL 6723400, at *5 (D.N.J. Dec. 21, 2011) (rejecting expert opinion at summary judgment “as no more than theoretical speculation raising, at best, a ‘metaphysical doubt as to the material facts’”) (citing *Novartis Corp. v. Ben Venue Laboratories, Inc.*, 271 F.3d 1043, 1054 (Fed. Cir. 2001)). Plaintiffs’ experts do not explain how grade school grammatical principles do not apply to aircraft engine maintenance bulletins or otherwise justify reading the instruction to perform an inspection, at a minimum, every 300 hours, out of the bulletin.

b. Risk-Utility Test

Under the risk-utility test, a product is considered defective “if a ‘reasonable person’ would conclude that the probability and seriousness of harm caused by the product outweigh the burden or costs of taking precautions.”⁴¹⁶ Factors to determine the risk utility test are: 1) the usefulness and desirability of the product; 2) safety of the product; 3) availability of a similar, suitable, safer product; 4) feasibility of eliminating the unsafe character of the product; 5) user’s ability to avoid the danger by the exercise of care; 6) user’s anticipated awareness; and 7) the feasibility, on the part of the manufacturer, of spreading the loss.⁴¹⁷ Balancing of these factors is guided by the “common sense idea that products are unacceptably dangerous if they contain dangers that might cost-effectively (and practicably) be removed.”⁴¹⁸ “As with the consumer expectation standard, the Pennsylvania Supreme Court held that in nearly all circumstances, determining whether a product is defective under the risk-utility standard is a task properly left to the factfinder.”⁴¹⁹ The Court determined above that this case is not fit for resolution at summary judgment as to the consumer expectation standard. The Court now finds that it also does it fall into the narrow subset of cases that may survive summary judgment as to that standard, but not the risk-utility standard.

⁴¹⁶ *Tincher*, 104 A.3d at 389.

⁴¹⁷ *Id.* at 389-90.

⁴¹⁸ *Id.* at 390 (quotation and citation removed).

⁴¹⁹ *Cote*, 572 F. Supp. 3d at 105 (citing *Tincher*, 104 A.3d at 380).

Avco's argument to the contrary gets off to a rocky start where it claims that, because Knight invested a large sum of money into the Helicopter, it is therefore obviously useful and desirable. This overlooks the fact that, as it was originally sold, the engine was apparently less than desirable because it was insufficiently powerful. That brings the Court to the fourth factor, which is easily satisfied because Avco previously sold this very same engine, which produced less power, and thus had less of a risk of valve sticking. Taking a step backwards to the third factor, the Court has found that Plaintiffs' have admissible expert opinion evidence that shows the availability of similar, suitable, safer products. The fifth and sixth factors overlap with the above discussion regarding whether the service bulletins are sufficient to put users on notice of an issue.

Where there are, at minimum, genuine questions of fact as to five of the seven factors, summary judgment is inappropriate.

C. Causation

Avco also argues that Plaintiffs' product liability claims, as well as their negligence and failure to warn claims, fail for want of proof of causation. As above, issues of proximate causation are generally questions of fact for the finder of fact, only removed from the jury's consideration when it is clear that reasonable minds could not differ on the issue.⁴²⁰

⁴²⁰ *Sikkelee*, 907 F.3d at 716.

Avco offers three arguments that Plaintiffs have failed to establish proximate causation: 1) there is no admissible evidence that the No. 1 exhaust valve was sticking at the time of the accident; 2) the accident itself is not sufficient to show causation; and 3) even if the exhaust valve was sticking, there is no evidence that it resulted in a reduction of power sufficient to cause the Helicopter to depart from controlled flight.⁴²¹ Avco's Motion for Summary Judgment on these issues rises and falls with its *Daubert* Motion. Because the Court will deny Avco's *Daubert* Motion, it must also deny its Motion for Summary Judgment.⁴²²

VII. CONCLUSION

For the foregoing reasons, Defendant Avco Corporation's *Daubert* Motion and Motion for Summary Judgment are denied. Plaintiffs Joanna Knight's and Allison Clarke's *Daubert* Motions to Exclude Expert Testimony of Timothy Tucker and Gary Feith are granted in part and denied in part. For clarity, those motions are granted as to 1) Feith's opinions that the accident was caused, in whole or in part, by obscuring weather; 2) Feith's opinions regarding aeronautical decision making or hazardous attitudes; 3) Tucker's opinion that the accident was caused by external pressures; and 4) Tucker's degree of certainty that the accident was caused by spatial disorientation or a failure to perceive a horizon. Plaintiffs' Motions are denied in all other respects. The denial of the parties' Motions is without prejudice to the parties'

⁴²¹ Doc. 74, Section I.

⁴²² See *supra* Section III.B. (discussing challenge to Plaintiffs' experts' causation opinions).

right to argue at a later date that certain testimony or legal argument is otherwise inadmissible or inappropriate.⁴²³

An appropriate Order follows.

BY THE COURT:

s/ Matthew W. Brann

Matthew W. Brann

Chief United States District Judge

⁴²³ See, e.g., nn.278, 281 (reserving judgment on whether consumer expectations test is appropriate); Doc. 124, at 18 n.3 (suggesting that certain expert testimony may be inadmissible under Rule 403 if the Court grants Plaintiffs' motions).